

American Aviation

AUGUST 1,
1950

25c

THE AIR
INDUSTRY'S
PIONEER
INDEPENDENT
MAGAZINE

Just a Dream

THIS IS the way it might have been: The Pentagon and the White House knew from intelligence reports that the North Koreans were getting ready for something but it is our reasoned policy not to provoke war so it was well known and understood that if and when the North Koreans launched an actual invasion of South Korea, we would lose the initial round.

by
W. W. P.

But the Pentagon was prepared for any emergency and we would quickly regain any initial losses. The lessons of World War II had been learned well. Mobility

was the keynote of our military planning ever since 1945. It was obvious that any intelligent planning called for an airborne division which could be moved quickly to any trouble spot in the world.

It really made not too much difference where the trouble might occur. The fully-equipped airborne division could move across continents and oceans in a few hours, so it was kept in readiness at home. Naturally it would take more than one airborne division to put out the fire but this one division would serve as a holding force until other divisions could be organized and moved in.

The Pentagon had learned in World War II that transport airplanes were as necessary in future conflicts as strategic bombers and tactical fighters. The long-range jet and rocket program was, of course, continuing, but the Pentagon, having learned the clear lessons of the last war, was prepared for any kind of action.

Last time the military brass were completely unprepared for the use of air transport and had to requisition planes from the airlines. But not this time. Hadn't Stephen Early, Deputy Secretary of Defense, testified before a Senate committee on January 30, 1950, that "Among the questions your chairman asked was, first, a statement of national defense mobilization requirements for transport aircraft of both cargo and passenger types. The three services, through the Joint Chiefs of Staff, have provided us with the amount of airlift that is regarded as necessary for the prosecution of a war during its first two years." It was heartening that the Pentagon had recognized that a complete commercial airline system needed to function in wartime. The Pentagon had made plans for its own transport planes. The lessons of World War II were clearly clear enough for that, of course.

(Turn to Page 8)



P & W General Manager

William P. Gwinn, general manager of Pratt & Whitney Aircraft since 1943, has been a key figure in P & W's postwar jet development program. Gwinn became general manager at the age of 36 and has moved up fast as a top industry executive. P & W celebrated its 25th anniversary at East Hartford, Conn., on July 26 with ceremonies including dedication of its new turbine laboratory. (See story page 27).

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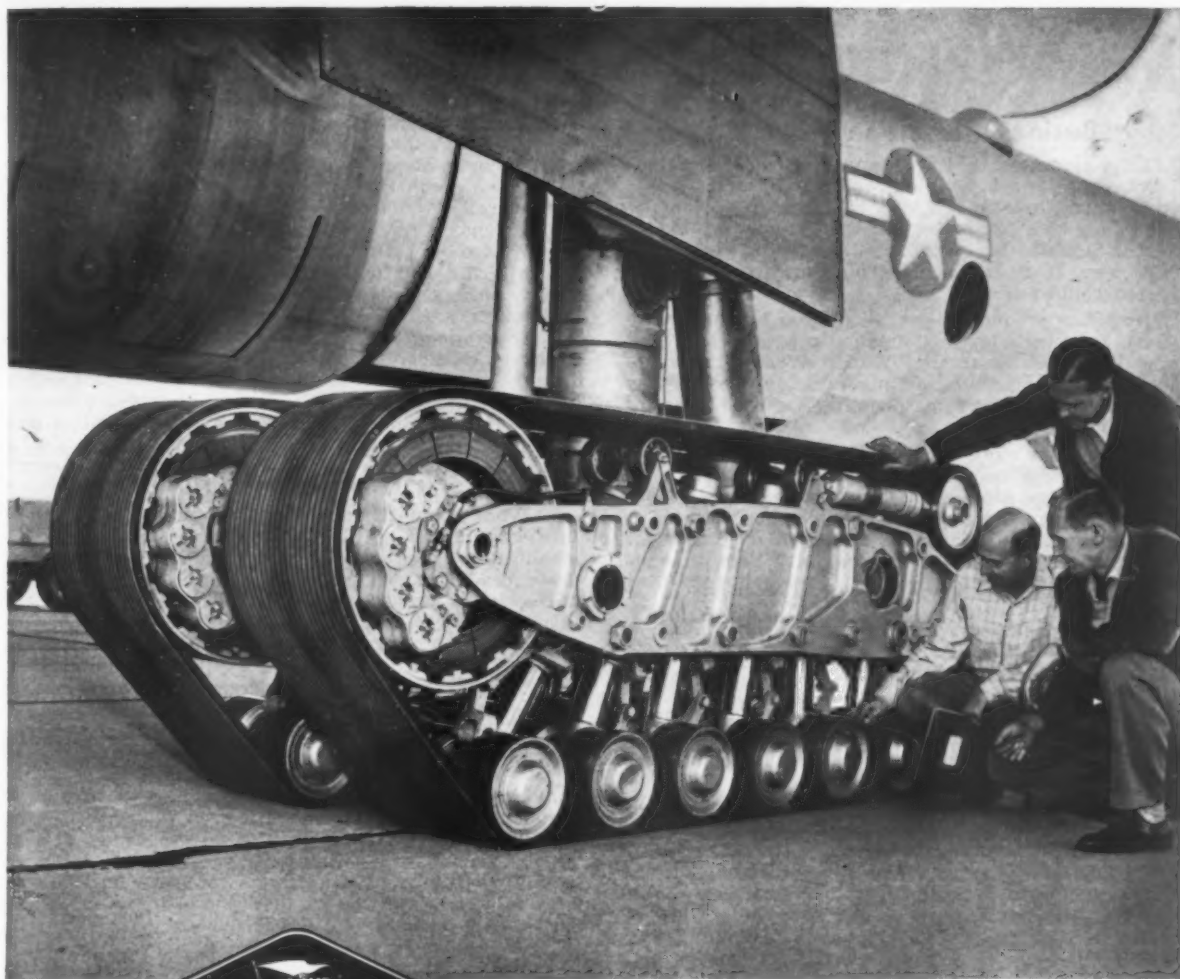


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for safe handling of the world's largest bomber. This track gear gives the B-36 a "footprint" three times larger than conventional wheel gear—makes it light enough on its feet to use many additional runways. Goodyear leadership in landing gear design explains why more aircraft use Goodyear equipment than any other kind.

Goodyear, Aviation Products Division
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MORE AIRCRAFT LAND ON GOODYEAR TIRES, TUBES, WHEELS AND BRAKES THAN ON ANY OTHER KIND

War and the Aviation Industry

Business for Plane Makers

WITH seriousness of Korea apparent, and President Truman asking \$10 billion for defense, aircraft production (Air Force and Navy) will be stepped up by \$3.4 billion. This is double the procurement program provided in fiscal 1951 appropriations being considered by Congress. U. S. is preparing not only for Korea but for what could follow.

How fast production can be stepped up remains to be seen. Industry's level of preparedness is about what it was before U. S. entered World War II—thanks to award of industrial mobilization contracts to industry by Defense Dept. At least some planning has been done for emergency production.

But it takes more than the push of a button to get airplanes. It will take time—more so than before—to reach full-volume production, if that is necessary. Planes are more complex, as is industrial mobilization machinery. Latter involves plant lay-outs, re-design of planes for volume production, subcontractors, etc. Some manufacturers are fairly well prepared; others have a long way to go.

So don't look for a sudden big leap in production. Not even in 30 months could industry reach its peak World War II rate. Whether industrial mobilization contracts will be implemented is still indefinite. But out of \$10 billion, Air Force gets the largest share \$2.7 billion for new planes, almost \$2 billion for operational and other uses. Navy gets \$646 million for planes plus operational money.

There's no doubt about need for planes. As Korea develops, AF may be losing more planes than industry is delivering. It's getting about 140 a month in 1950; total is 1,732 for the year. Add to Korean losses the normal attrition in U. S. and AF plane inventory can be pushed under the danger point. Navy is getting 80 monthly; 981 for the year. Top optimistic estimate is that 600 monthly could be produced within a year for both services.

What will be ordered?

- Lack of airlift is critical; top priority will probably go to transports: **Douglas C-124, Boeing C-97, Lockheed C-121, Fairchild C-119**, all of which are in production.

- Certain to be included are two standard bombers, **Boeing B-47** and **Convair B-36**, and jet fighters like **Republic F-84E** and **North American F-86** and **F-95**.

- Future production will probably include later versions of these planes: **Republic YF-96**, swept-wing **F-84**, **North American F-93**, a larger, more powerful **F-86**. Navy will get carrier fighters like **Grumman F9F** and **McDonnell F2H**, and **Douglas AD** and **North American AJ** attack bombers.

In a move toward volume production, where might bottlenecks occur? One possibility is engines, also engine accessories, which generally lag behind airframes. Government furnished equipment is another—it's derived from commercial businesses which, because of government profit ceilings, have little incentive to react promptly to changed military requirements.

What's been happening prior to a production step-up? Preparedness to a degree has been indicated.

Douglas hired more workers to recondition 150 B-26 attack bombers.

Grand Central Airport Co. started demothballing B-29's and reconditioning F-51's and Merlin engines.

Pacific Airmotive sought 1,000 workers to recondition F-51's and Pratt & Whitney engines.

Navy was reconditioning about 500 F4U fighters at San Diego.

Allison Division of General Motors (jet engines) canceled a scheduled two-week plant shut-down for em-

ploye vacations, will pay workers for the lost vacation. Convair's Ft. Worth plant went on two 10-hour shifts to meet stepped-up production.

Boeing canceled scheduled employment cutbacks, sent out calls for 100 skilled machinists. These were some of the signs.

West coast plants were still being somewhat selective in hiring. But, with skilled and semi-skilled market already thin, selectivity won't last long when the work load jumps.

Summing it up: big money will be pumped into the industry; production will increase, and stay up indefinitely. But there'll be no sky-high production unless and until industrial mobilization contracts are implemented. Meanwhile, U. S. is getting existing planes into fighting shape.

First Aid from Airlines

What about the airlines? They still aren't exactly sure what they'd do in an all-out emergency. But their mobilization plan is being rushed—National Security Resources Board took it over from Air Coordinating Committee in an unfinished state, said it would fill in the blank spaces—fast.

No priority system is contemplated now. Rumors that there might be one caused a dip in airline business, which was taken up only by increased military business. Airlines have permission to remove a ticketed passenger if military needs space. Even this isn't considered an out-and-out license to throw people off—major effect will be to discourage damage suits if a passenger is so inconvenienced. In any event, airlines have been able to handle heavy loads; no one has been removed.

If, as military situation develops, space gets critical on airlines, look for discontinuance of promotional fares, family plan, possibly air coach.

Air Force, paying for extreme shortsightedness in airlift requirements, was chartering airline planes (with crews) for Pacific use. When all contracts are drawn, they'll have 63 scheduled and non-scheduled transports. Airline schedules haven't been hurt so far. There are no plans for further chartering now.

Scheduled lines and non-skeds have 38 DC-4's and 101 C-46's on lease from AF. They're subject to immediate recall, but there's no plan for immediate action.

With high domestic schedule volume plus military charters, look for a large number of furloughed airline pilots to be recalled. Some have already been contacted (144 by Pan American), others will follow.

Airlines flying the Pacific no longer had worries about Air Force pulling out of Shemya in the Aleutians (AF several months ago said it would abandon Aleutian bases July 1). AF plans to stay indefinitely.

Korean war has caused travel shifts—cancellations to Hawaii, increase in air travel to Mexico. Further scares in Europe could cause Latin American travel boom.

Pushed into the background and forgotten is any possibility of reduced taxes on transportation of passengers and freight.

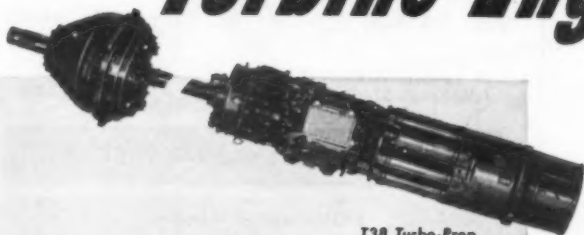
Airlines are again proving their national defense worth. They're taking up the airlift slack and providing domestic transport for military officials. They're in much better shape to do it than last time. At Pearl Harbor, airline fleet totaled some 360, practically all twin-engined. It's now about 1,100. Significantly, four-engined planes total more than the entire fleet in December, 1941.

Civil Air Plan Lacking

Ignored in defense effort are civil flight schools, fixed base operators, private flying in general. If there's any plan for training military pilots and mechanics in civil schools, the schools are completely in the dark about

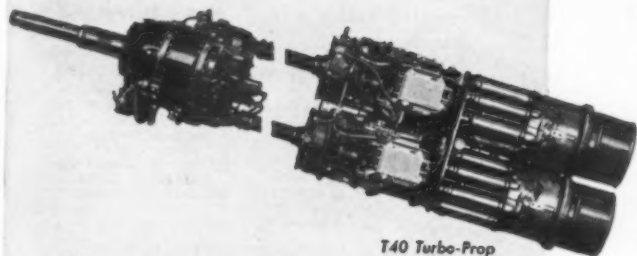
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Allison FIRSTS — Proof of Turbine Engine Leadership



T38 Turbo-Prop

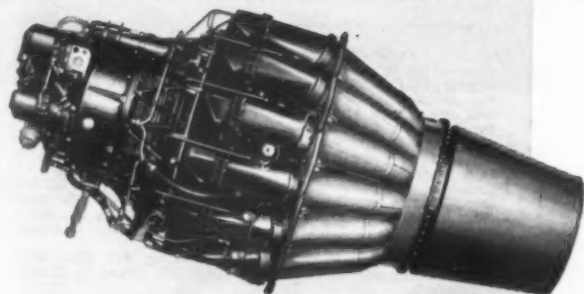
FIRST to complete 150-hour qualification test for Turbo-Jet engine with afterburner.



T40 Turbo-Prop

FIRST to complete 150-hour qualification test for Turbo-Jet engine with water/alcohol injection.

FIRST to complete 150-hour qualification test for any Turbo-Jet engine.

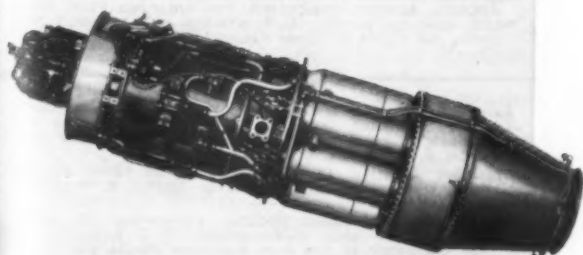


J33 Turbo-Jet

FIRST to complete 50-hour flight clearance test for U. S. Turbo-Prop engine.

FIRST to put Turbo-Jet engines in production with either afterburning or water/alcohol injection.

FIRST to purchase its own airplane to proof-test Turbo-Prop engines for commercial transport use.



J35 Turbo-Jet

FIRST to design and release for production a Turbo-Jet fuel control which meets combat operational requirements.

FIRST to get commercial certification of a Turbo-Jet engine.

FIRST to fly a propeller-type engine producing more than two horsepower per pound of weight.

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War and the Aviation Industry

(Continued from Page 4)

it. What happened in World War II could happen again—a late start, then a sudden deluge. Industry wants planning now, to prevent mistakes. The matter is said to be receiving active study, but there is no likelihood of a civilian-operated flight training program before September at the very earliest.

Only bright spot is possible passage of bills now in Congress (S. 3846 and H.R. 9019) creating Reserve Officers' Training Corps in Air Force, Navy, Army. AF could contract for flight training with civil flying schools where colleges lacked facilities (most of them do). This would be a start.

Air Defense Planning Board has been set up jointly by AF, CAA. It's to draw a master plan for civil participation in air defense of U. S.—identification of friendly air traffic, channeling information to air defense control centers, using CAA facilities and personnel in an emergency. However, "civil" participation means CAA, not schools or other private aviation facilities.

Merger Held Up: As of Tuesday, July 25, the merger of American Overseas Airlines and Pan American World Airways was still held up (see story on page 20). All parties agreed not to proceed with consummation of the merger pending two new court appeals by TWA and James M. Landis, representing a group of AOA employees. Hearing was to be held July 26 in New Haven, Conn., before three judges of the U. S. Court of Appeals for the Second Circuit on TWA and Landis motions for a stay of the CAB decision and for court review of the entire case. Whether there would be further delay in merger plans depended on the court's ruling.

Mystery: There had been rumors in Washington that ink eradicator had been used to attempt to remove the signature of President Truman on the first order which he sent to CAB approving the Board's original action in rejecting, 3 to 2, to AOA-PAA merger. TWA and James M. Landis both petitioned CAB for permission to examine the original document. On July 21 CAB granted this permission and Tom Taylor, of TWA, and Stanley Gewirtz, law partner of Landis, called on CAB to examine the letter. The original document was found by a CAB official in the office of Acting Chairman Oswald Ryan. Both Taylor and Gewirtz reported that apparently someone had attempted to remove the President's signature with both an ink eradicator and with an eraser. It seemed likely that "The Case of the Missing Signature" would play a prominent part in further efforts to upset the final approval of the merger as ordered by President Truman in his second letter to CAB.

Defense Survey of Civil Aviation: Plans are underway for a CAA-sponsored survey of the potential emergency utilization of the nation's civil (non-airline) aviation industry. Survey was recommended by CAA's Aviation Development Advisory Committee, which expressed deep concern over the ultimate utilization by the military of facilities and personnel of all phases of civil aviation and the lack of any known plan on the part of the military with regard to how much utilization would be accomplished and what restrictions might be imposed on the industry. The committee believes an inventory of civil aviation resources could be taken within 30 days.

O'Connell Successor: There are fears in airline circle of a highly political appointment to Civil Aeronautics Board vacancy created by resignation of Chairman Joseph J. O'Connell. There have also been rumors of CAB shift into Commerce Dept. and other moves which may strip CAB of whatever independence is left. Mentioned for Board vacancy have been James Pinkney,

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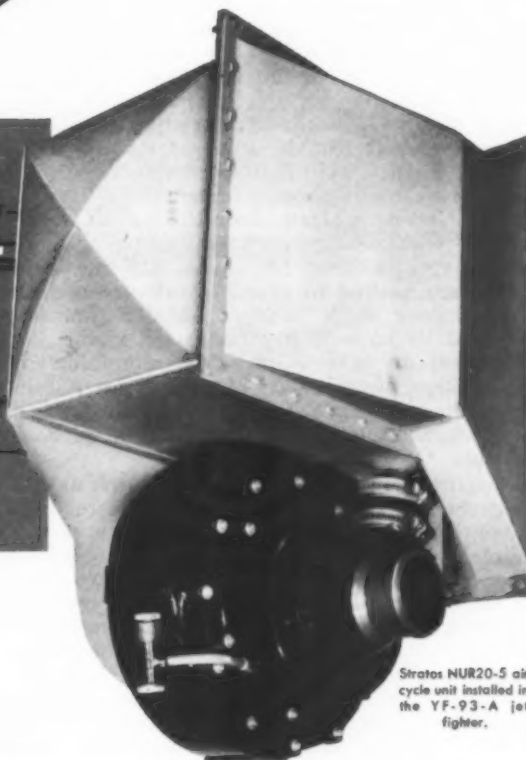
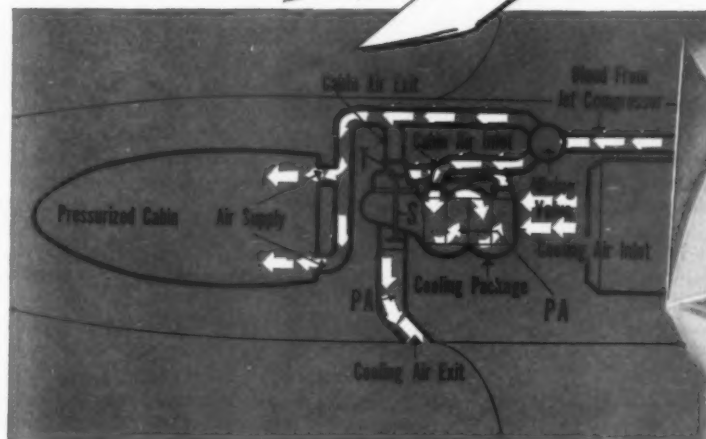
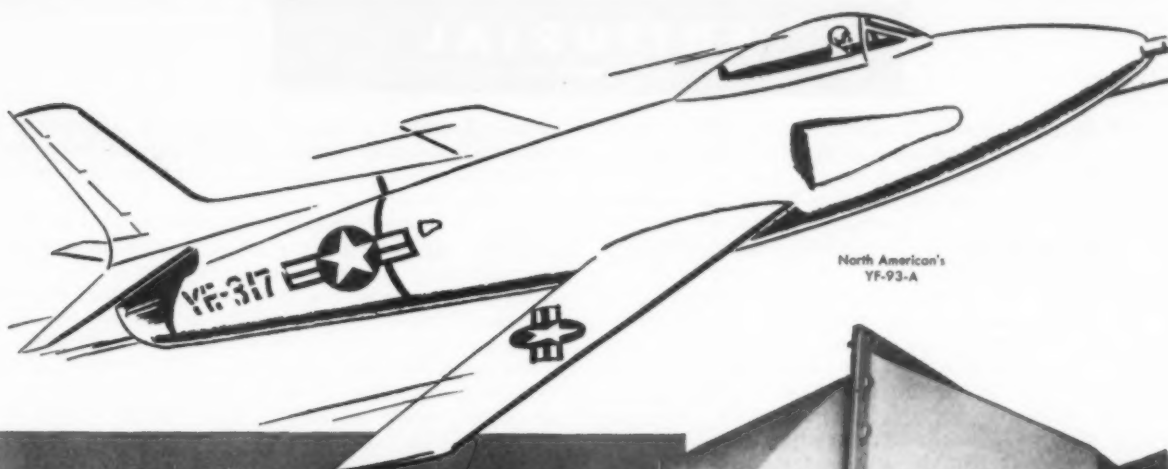
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EDITORIAL

(CONTINUED FROM PAGE 1)

And Military Air Transport Service was ready, too, to provide long-range air lift to any part of the world. At the end of World War II some of the extremely-narrow-minded top brass had wanted to break up MATS as a world-wide transport service and chop it into theater units, so that when a MATS airplane arrived in any particular theater it would automatically be controlled by that theater. Some of the brass couldn't see the need for an independent world-wide aerial supply service but the lessons of World War II were very clear so the intelligent top brass in the Pentagon insisted on retaining MATS as an over-all transport operation which could be utilized immediately no matter where the next trouble occurred.

So when the North Koreans launched their invasion, we were all ready. (It might have been Yugoslavia, Germany, Iran, Indo-China or any other place). Within 48 hours the airborne division was on the ground ready for action, and the airplanes used were shifted to supply work as soon as the division was fully landed. MATS immediately switched its large fleet of transport planes into an aerial supply service to take in reinforcements, ammunition, and all sorts of equipment. Within one week there was already a change in the Korean situation although it would take time to complete the job.

Meantime the Pentagon fully realized, as *Fortune Magazine* has pointed out, that the secret of U. S. industrial power is not to commit its vast reserves prematurely, to permit those essential drives and freedoms that give our economy its great strength to work to the latest hour that military safety will allow. The Korean situation created hardly a ripple in our economy because we had learned that the mobility offered by air transport can hold the fort and give us time to move up without wrecking industrial economy. By the same token a strong commercial airline system is a necessary domestic adjunct to industrial strength.

P. S. Yes, it's all a dream. Despite the billions and billions poured out for "national defense" since World War II, there was no airborne division in readiness, MATS was hammered into subjection and subordination, and the Pentagon hastily requisitioned 10% of the four-engined transport planes of the U. S. commercial airlines and hinted that it would take more. How clear the lessons have been and how costly the penalties for ignoring them!

White House Takes Over

PRESIDENT TRUMAN'S reversing of his own initial decision and his reversing of the Civil Aeronautics Board by ordering both approval of the acquisition of American Overseas Airlines by Pan American Airways and major changes in the route structures of both Trans World Airlines and PAA, points up the tremendous change in the handling of U. S. international air policy since the passage of the Civil Aeronautics Act in 1938.

Congress created the Civil Aeronautics Authority—subsequently broken up by executive action under wartime powers—as an independent agency responsible to Congress. The President was to appoint members of the five-man board, subject to Senate

approval. The President was given authority to approve of Board decisions in international routes. Otherwise, the CAB was to be independent of the executive branch of government.

Step by step President Truman (and his predecessor) have altered the original legislative thinking that went into the Act until now, in the PAA-AOA merger case, the President has taken into his own hands the entire handling of international airline matters. And by so doing, the CAB has become impotent. Weeks of hearings, stacks of briefs, and even the Board's own decision, proved to be an utter waste of time. The White House has captured whatever powers Congress intended the five-man Board to have.

Not only that, but a man who tried to do a good job as chairman was bounced out in humiliating fashion. However right or wrong his thinking may have been to partisans in specific cases, Joseph J. O'Connell, Jr., stood up in honest fashion for what he thought was right. He didn't deserve the kicking around he received not only in this case but in another important domestic case last year in which Defense Secretary Louis Johnson vied with President Truman (and won) in trying to dictate to the Board.

Last issue we berated the Civil Aeronautics Board for submitting to outside (and inside) pressures. In the latest merger case, at least, the Board had no choice but to submit. It was told what to do in humiliating manner. Considering the terrific pressures on all sides, those members who did endeavor to act with independent mind in what they considered to be the best interests of U. S. policy, deserve great credit.

Back in 1937 and 1938 the airlines wanted to get out from under politics. The echoes of the Black investigation of 1934 were still reverberating. All agreed that a strong, independent quasi-judicial agency was needed to act in the best interests of the country, the public, and the industry. No matter how strongly built a house may be, no matter how firm the foundations and the ethics of the constructor, it doesn't take much hacking away at the walls and struts to make the house collapse. The fault isn't with the builder, the fault rests with those who hack away at the basic structure until it becomes weakened and collapses.

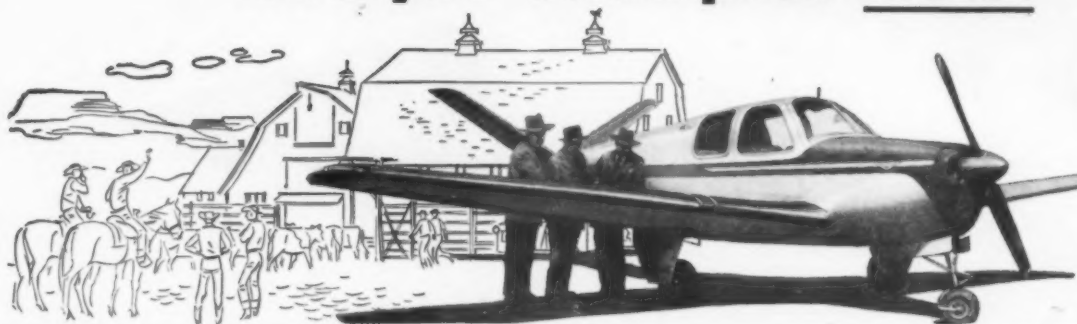
As this is written the White House is endeavoring to find a successor to Mr. O'Connell, and there are reliable reports of a major reorganization in the Commerce Department affecting the CAB and the CAA. A great effort will have to be exerted to restore confidence in CAB and strong measures will have to be taken inside CAB to eradicate at least one source of current troubles. If only one-tenth of the talk going the rounds in Washington is true, one of the prime sources of partisan trouble reaching both inside and outside the Board is to be found within the Board itself. Confidence cannot be restored, as some of the members know, until one of their colleagues stops deferring to high political sources in matters of vital importance to a strong and healthy air transport industry. It takes only one member in a family to cause the house to collapse.

WAYNE W. PARRISH

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Luxuriously appointed cabin carries four with plenty of "stretching room." Quiet soundproofed cabin lets you arrive ready for action. Luxury touches: arm rests, ash trays for all, three map pockets.



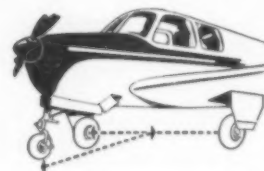
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One of the first bombers to face this problem was the Air Force's 4-jet B-45 "Tornado"—built by North American Aviation (above). B. F. Goodrich engineers set out to solve it. They designed a lining for the B-45 diffuser cowl, in the "throat" that funnels air to the combustion chamber. A lining made of B. F. Goodrich electrically

heated rubber—thin, tough rubber with a core of resistance wire (see inset photo).

The resistance wires were precisely arranged to concentrate heat where it was most needed. A thermostatic control was added. Then, with electric rubber supplying the heat, the diffuser cowl was put through a series of rugged icing tests. No ice formed—the problem was licked!

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Besides diffuser cowls, B. F. Goodrich electric rubber is doing a successful anti-icing job on propellers, control surfaces, wings, air scoops, hydraulic lines, water tanks and many other airplane parts. It is a typical development of the BFG research that supplies aviation with effective answers to tough problems. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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PUSH-BUTTON
MOBILIZATION
FOR
INDUSTRY

By JAMES J. HAGGERTY, JR.



WITH THE SITUATION in Korea looking blacker every day and the ominous shadow of World War III lurking in the background, there is one question which a lot of people are asking: How do we stand as regards ability to mobilize for an emergency?

The question used to be: What is our state of readiness? to which Defense Secretary Louis Johnson used to toss out a casual reply that our defenses were "adequate for the hour" as he lopped another million off the budget. No one is asking that question any more. It has become apparent that our defenses were not adequate for the hour, not even adequate to handle a second class war with a minor oriental power, much less test the might of the Soviet Union.

So now Question A is whether our industry is prepared to repeat its mobilization performance of the last war.

In the daily press recently there was a story to the effect that it would take only a teletype from the Pentagon to set the wheels of industry rolling in an all-out aircraft production effort and that soon the planes would be rolling off the lines on a scale reminiscent of World War II. This is a somewhat optimistic viewpoint. The Pentagon is good at filling the air with teletypes, but before those planes start rolling out on the ramps, there are a few physical problems to be solved.

Generally, the aircraft industry today is about on a level of prepared-

ness with the level just before we entered the last war, when we had the benefit of over a year of mobilization measures. Today's degree of preparedness is largely due to a foresighted industrial mobilization program in which the Defense Department awarded contracts to industry to prepare plans for emergency production. However, although a certain degree of readiness has been achieved through this program, it might be stated that a lot more money and a lot more effort could have been expended in that direction. Anyway, here's how industrial planning works from the aviation standpoint.

Missions Assigned

First, the Joint Chiefs of Staff assign to each of their air services its M-Day mission—just what would be required of the particular service in the event of an all-out emergency. The operations staffs of the Air Force and Navy then decide just what type and how much equipment it will take to handle their assignments and transmit them to the materiel agencies as M-Day requirements. It is up to the materiel agencies to develop and finance planning measures which will permit the industry to meet these requirements.

For an example of the workings of an industrial mobilization contract, let's look at Fairchild Aircraft Division, which builds one of the key planes in any emergency, the C-119 Packet, and which is one of the most

advanced companies in the industry mobilization-wise.

Detailed Planning

The Air Force decided that, under mobilization, Fairchild would have to turn out x number of C-119's. Obviously Fairchild's present plant at Hagerstown, Md., is not large enough to handle M-Day production. So the Air Force's Air Materiel Command assigned Fairchild a new plant out of its industrial reserve (the Air Force owns 29 reserve plants suitable for airframe and engine production) and gave the company a contract to set up the new plant on a skeleton basis. Fairchild made a detailed layout of the new plant, showing just where each tool and each jig would be placed, where the various assembly points would be, etc.

Then the company prepared a series of detailed books in which the mobilization requirements of each plant sub-section are outlined. On M-Day, the foreman or supervisor of a given shop is handed one of these books; it tells him how many people he will need, what kind of tools he will need, where they will be located, the schedules he is expected to meet, how his shop will be organized, policies, procedures and methods he must observe—in effect, everything he needs to know to organize his shop and get it operating on a stepped-up basis.

Fairchild has already designed the tools it would need for high-volume production, although in this respect the company is unique. The design

of a plane in low-volume production is considerably different from that of one in high-volume production. For instance, the whole main fuselage section of certain planes now in low-volume, or peace-time, production is built in a single forming jig. Obviously this system would not lend itself to accelerated production.

High-Volume Design

For high-volume production the fuselage must be broken down into a number of smaller parts designed for ease of transporting, assembly, subcontracting, etc. Fairchild's C-82 Packet was an example of the low-volume designed airplane. But at the time of the change-over of the production line to the new, improved Packets, the C-119's, the Air Force gave Fairchild its industrial mobilization contract. Thus the company was able to redesign the plane for high-volume production, and although current orders call for only a few planes a month, the C-119 is completely designed for all-out production. Fairchild has physical tools only for the current low-volume production but the design of these tools is for mobilization production.

Fairchild has also developed, under its industrial mobilization contract, what it calls the "subcontract package," an important item in any mobilization plan, since, in the case of the C-119, 37% of the airplane would be built in subcontractors' plants. The subcontract package is a bulky manila envelope which contains everything the subcontractor would have to know about the part he would build for the C-119.

It gives him the detailed engineering drawings of the part, the type of machinery he will need to build it, the floor loading of the machinery, the number of people he will require, the materials he will need and where to get them at how much, the schedule of deliveries he must meet, how and where to transport the finished sections or parts, etc.

Subcontractors Chosen

Fairchild has prepared a package for each part or section of the C-119 it would subcontract and has indicated to the Air Force which subcontractors it would like to have handle the work. These subcontractors were picked, for the most part, because of their proximity to the assembly plant, although in some cases compromises were made between ability to handle a certain assignment and the minimum shipping problem.

Fairchild has worked out a plan to put the new assembly plant into operation as quickly and efficiently as possible. In the last war, when a new plant was opened, the parent plant which had been building the particular airplane would ship the new plant about 10 complete plane assemblies in major sections. While the plant was being tooled up, these ten

planes would be assembled, serving the dual purpose of familiarizing new employees with the assembly work and at the same time getting an assembly line started. However, since the major sections were completed, the assembly didn't take long, and there would be a long gap between the completion of No. 10 and the major assembly of No. 11, the first plane the new plant would build.

To correct this inefficient operation, Fairchild has a plan whereby the parent plant would provide the new plant with 25 airplanes, but instead of being in major sections they would be in various stages of assembly.

One would be virtually complete, in major sections; perhaps the next nine would consist of minor as-

semblies, while another seven or eight would be in sub-assemblies. The remainder would consist merely of parts in no stage of assembly. Thus, by the time No. 25 was in a major assembly stage, the new plant would have had time to start turning out its own parts and No. 26 could follow right behind without a gap.

Plan of Action

So, to sum up: if the Pentagon gave Fairchild the green light on all-out production, the company would assign part of its present staff to the new plant, start an employment program, start building the already-designed tools and locating them in their pre-designated positions in the new plant, and hand out the subcontract

Timetable for Industry Expansion

EXPANSIBILITY of the U. S. aircraft industry has become a major question in the past 30 days.

The industry has been given a limited go-ahead, and the signal for stepped-up production of bombers, fighters and military transports should come shortly. How soon can high-volume production of planes be attained?

The following table depicts the expansion of the industry in World War II, (beginning with the President's call for production of 50,000 aircraft annually), and current expansion potential based on existing production rates.

World War II			Now		
	Monthly Production	Total Production (End of 12 mos.)		Monthly Production	Total Production (End of 12 mos.)
May 1940 ..	450		July 1950 ..	215	
May 1941 ..	1,339	10,209	July 1951 ..	645	4,400
May 1942 ..	3,983	30,630	July 1952 ..	1,935	15,500
May 1943 ..	7,086	60,068	July 1953 ..	5,000	38,000

The World War II production rate of 50,000 planes per year was reached in 24 months after the go-ahead, but there was the advantage then of a year of industrial mobilization. Today, lacking this advantage, it would require 34 months to step up our aircraft production rate from its current low base to an annual rate of 50,000 planes.

However, this expansion potential presupposes not only that there will be no enemy interference with our industrial system, but also that the nation has an effective up-to-date mobilization plan which will assure adequate quantities of components, accessories and other elements vital to the building of modern planes. And the plan we have is deficient in many respects.

On the bright side, we have these factors:

- **Of the more than 1,000 modern industries plants** built during last war, approximately 500 were kept under government control, and the Munitions Board has specific plans drafted for putting 253 of these on an immediate wartime footing when required.
- **An additional 200 plants are in reserve**, either on a standby basis or on stipulation that they be kept in condition to convert to wartime production within 120 days.
- **More than 161,000 general purpose machine tools** have been stockpiled, permitting machine tool makers to concentrate on production of special purpose tools critically needed in the event of full-scale mobilization.
- **More than \$1,500,000,000 of materials** were in the national stockpile of critical materials in June, with another \$500,000,000 worth in process of delivery.

This reserve of plants, tool and materials will offset to some extent the increased complexity of producing modern aircraft.

Source: Aircraft Industries Association of America.

packages to the pre-designated subcontractors. Meanwhile, the parent plant at Hagerstown would step up its own production to the limit of its capacity under a similar mobilization plan.

That's how the program works with an airframe. But airframes are not the only items involved in industrial planning. Last year, fiscal 1950, the Air Force spent some \$17,000,000 on industrial planning measures similar to the C-119 program. Chief item of concern last year was engines; \$3,500,000 was spent preparing for emergency production of engines like the Pratt & Whitney R-4360, the General Electric J-47 and the Allison J-33 and J-35, the latter three jets.

An example of how the money is spent is contained in a breakdown of the J-47 program: engineering redesign for high-volume production, \$200,000; operation planning of manufacturing processes, \$25,000; tool design and fabrication of critical items, \$125,000; machine tool planning, \$75,000; plant layout, \$50,000; test cell equipment, \$150,000; planning with licensees (probably non-aviation companies like Ford, Buick, Nash and others), \$200,000. Total, \$825,000.

In addition to engines, other items covered in last year's mobilization planning included propellers, fire control systems, bombing systems components, bomb sights, radio and radar, landing gear, turbo-superchargers, test equipment, automatic pilots, instruments and ground handling equipment.

All Not Ready

From the foregoing one might get the impression, mentioned earlier, that the Pentagon need only press a button to start the planes rolling off the line. Such, unfortunately, is not the case. There are a lot of flies in the industrial mobilization ointment.

Fairchild Aircraft Division is far from a typical case; it is probably the readiest of all the aircraft plants. Other manufacturers are in various stages of industrial mobilization planning. Some have worked out plant layouts for their assigned reserve facilities, but have not redesigned their planes for high-volume production, an important factor in view of the fact that engineering alone would require a year and tooling perhaps another year. Others haven't even completed plant layouts. Still others have nothing but a vague idea of what they would be called on to do on M-Day.

While the planning measures which have been taken are big steps toward industrial preparedness, not enough of them have been taken. For instance, although the Air Force uses about 15 major engine types in the planes it has in service, only five figured in last year's planning measures. In the last two years the Air Force alone has spent well over \$20,000,000 on planning measures, but this

is only a drop in the bucket compared with what it would have cost to work up a complete mobilization plan during that time.

Another bottleneck is the lack of a subcontract master plan. A year ago the Air Force asked prime contractors to state their preferences as to what subcontractor they would like to have handle a particular section of their airplanes in the event of mobilization. The Air Materiel Command was supposed to have assembled the preferences and then assigned subcontractors to each prime contractor, seeing that no subcontractor was assigned more than he could handle and that subcontractors were located reasonably near their prime contractors to simplify transportation problems.

This has not yet been done, and if today were designated M-Day, prime contractors would find themselves in the awkward position of not knowing with what subcontractors they were to do business.

Bright Side

On the bright side of the ledger, we have a good industrial capacity due to the number of plants built in the last war, we have a labor pool available, we have non-aviation contractors who gained aviation know-how in the last war, and we have, although it is far from perfect, a plan.

Summing up, it might be said that we have at least the foundation for a mobilization effort and we could probably mobilize the aircraft industry with less confusion than accompanied the last mobilization. But it will take, at best estimate, some 30 months before the industry is in full high-volume production, due chiefly to the necessity for redesigning most plane types and tooling up the plants.

And it is doubtful that even in that long time we can attain anything like the 50,000-plane-a-month rate reached in the first two years of World War II, due to the far greater complexity of the equipment we are now building. Airplanes like the Convair B-36 and the Boeing B-47, for instance, do not readily lend themselves to the Willow Run type of production. So the ultimate conclusion must be that while we're prepared to a degree and are getting more prepared every day, we still need that big element *time*, probably even more than we did on the last occasion.

One thing which contributed much to the industry's current low degree of expansibility was the "economy" program imposed on the industry by Louis Johnson at a time when it was apparent to practically everyone that such economy was out of order. That political economy is finally being thrown out the window. We can save months by making M-Day now instead of waiting for a full-scale war to break out. Mobilization will be costly, astronomically so, but lack of it might be more costly.

Aviation Calendar

July 30-Aug. 13—National soaring contest, Grand Prairie, Texas.

Aug. 7-17—CAB Annual review of airworthiness regulations, Washington, D. C.

Aug. 19—Tennessee Air Progress Conference, Knoxville, Tennessee.

Aug. 19-20—1st Annual California Air Freight Clinic, Oakland, California.

Sept. 4-6—National Flying Farmers Association annual convention, Bemidji, Minnesota.

Sept. 12-14—Conference on Ground Facilities for Air Transportation, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Sept. 27-30—Society of Automotive Engineers Aeronautic Meeting and Aircraft Engineering Display, Biltmore Hotel, Los Angeles, California.

Sept. 28-30—Air Reserve Association annual convention, Hotel Texas, Ft. Worth, Texas.

Sept. 28-30—International Northwest Aviation Council 14th annual convention, Sun Valley, Idaho.

Oct. 2-4—National Association of State Aviation Officials annual convention, Minneapolis, Minnesota.

Oct. 12-13—1950 Conference on Airport Management and Operations, Max Westheimer Field, North Campus, University of Oklahoma, Norman, Oklahoma.

Oct. 16-20—CAA Airports Advisory Committee meeting, Fort Worth, Texas.

Oct. 17-18—Third annual New York State Airport Management Conference, Syracuse, New York.

Oct. 19-20—Tennessee Aviation Conference, Knoxville, Tennessee.

Oct. 26-27—Fifth Annual Aviation Conference, Tucson, Arizona.

Nov. 30—Airport Fire Safety Clinic, sponsored by the Committee on Aviation and Airport Fire Protection, National Fire Protection, Ass'n, Baker Hotel, Dallas, Texas.

May 19-20—National Air Races, Cleveland, Ohio.

International

Sept. 4-10—Society of British Aircraft Constructors annual flying display and exhibition, Farnborough, England.

Sept. 14—ICAO Airworthiness/Operations meeting, Paris.

Sept. 19—ICAO Air Navigation Commission meeting, Montreal.

Sept. 27—ICAO Council meeting (11th Session), Montreal.

Sept. 28—ICAO Air Transport Committee meeting, Montreal.

Oct. 12—IATA Executive Committee meeting, San Francisco, California.

Oct. 16-20—IATA Annual general meeting, Fairmont Hotel, San Francisco, California.

Oct. 17—ICAO Middle East regional meeting, Istanbul.

Oct. 23—IATA Executive Committee meeting, Montreal, Quebec.

Nov. 14—ICAO Rules of the Air/Air Traffic Control Division meeting, Montreal, Quebec.

Jan. 2—IACO Legal Committee meeting, Mexico City.

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THE CASE OF THE



missing airlift

By GERARD B. DOBLEN

THE LOW priority which military leaders gave airlift in national defense planning has cost lives and ground in the battle for Korea.

If this country had been able to fly 15,000 well-trained troops with adequate equipment into South Korea the week after hostilities commenced, the picture might not be what it is today and the road back to the 38th parallel might not be so long and bloody. Fifteen thousand men could not have stopped 60-ton tanks but they could have stopped a lot of the ground troops that followed them. Tanks can be isolated and they do run out of gas.

All of this is connected with the high military strategy which assigned airlift a poor fourth and last place in the aircraft procurement program. This assignment of priority was done largely on the basis of two considerations: (1) The concept of global warfare involving an attack on U. S. by Russia and the need for retaliation in force. (2) Lack of funds.

Thus on the basis of the priorities assigned and within the limits of the money available, strategic bombers got the number one place, fighter escorts second, then tactical air sup-

port for ground troops, and finally air transports.

Unexpected Attack

And, as so frequently happens, Russia didn't play the game, or hasn't to date, the way our military leaders predicted. Instead of a sneak attack on the United States, her satellite—North Korea—sent troops and tanks into South Korea. This was wholly unexpected and it caught our military leaders with their wings down.

While responsibility for this situation to a large extent must rest on the shoulders of Secretary of Defense Louis Johnson who in his false economy drive succeeded in freezing \$800,000,000 in airplane funds last year, some blame also must be placed on top military leaders who established these plane procurement priorities. Most of these leaders are former combat heroes. They naturally think first in terms of bombers and fighters. One seldom hears of a transport or logistics expert being decorated for valor, hence they seldom get promoted to positions where their voice can be heard and their influence felt in the decisions that are made.

Suppose that the well-trained division of Marines which left the west

coast in a "slow boat to China" weeks after hostilities started could have been flown to South Korea within the first week. Even more realistically, suppose the two Army divisions which landed in South Korea on July 18, or 23 days after the fighting commenced could have been flown in shuttle operations the 400 miles from bases in Japan during the first five days of the fighting. What this might have saved in blood and money only can be conjectured.

Only 420 Transports

Under the 70-group Air Force program, there would have been 10 troop-carrier groups but the Truman-Johnson economy program required a reduction to 48 groups and under this reduction, only five troop-carrier groups were to be continued. This meant the utilization of only 420 heavy and medium type transports. Air Force sources say it would take 700 C-54 type transports to move one division.

Military leaders knew that in case of an emergency, this country's available airlift, both military and civil, was less than 30% of the ton-miles required.

A recent report by the Military Air Transport Service made public before



THE NEED for a fleet of military transports such as this Douglas C-124A Globemaster II was demonstrated early in the Korean War. The Globemaster can carry anything up to 50,000 pounds

payload a distance of 1,000 miles and return to its base without refueling, or a range of 2,300 miles. This could mean transportation for 200 fully equipped troops.

the House Interstate and Foreign Commerce Committee on February 18 included the following statement:

"The present strategic lift of the Military Air Transport Service is three-quarter billion annual ton miles toward meeting the requirements of 7½ billion annual ton-miles (in case of war). If all civilian strategic aircraft are made available, they will provide an additional lift of 2½ billion ton-miles, or a total of 2¼ billion. It is estimated that 10% of this lift will be required for route support, leaving two billion annual ton-miles to be applied to the annual requirement, and leaving a deficit of almost 5½ billion annual ton-miles."

Prophetic Testimony

Reiterating what he has been telling the military and Congress for the past five years, Capt. C. H. Schildhauer (U. S. N. Ret.), organizer of the Naval Air Transport Service in World War II, testified prophetically before the Senate Interstate and Foreign Commerce Committee on May 12 as follows:

"After attending hearings before your committee, hearing and reading statements of our defense officials, studying the Report of the President's Air Policy Commission, and the Report of the Congressional Aviation Policy Board, I feel that, at present, we are proportionately less prepared to meet our overseas airlift requirements than we were on Pearl Harbor day.

"Today we are planning a defense of mobility and speed via the air routes, but that planning has not produced adequate airlift capacity, in being, to meet our requirements, should we have to move on the defensive in Europe or southeast Asia. The Berlin Airlift and the recent Operation Swarmer should not make us sit back in self-satisfaction. Stretch the distances in those operations of a few hundred miles to several thousand and you will have the inadequate airlift capacity that we are so concerned about."

But even in the face of this information, Steve Early, Deputy Secretary of Defense, said the military had "the amount of airlift that is regarded as necessary for the prosecution of a war during its first two years." In further explanation of the military smugness, Early told a representative of 146 furloughed Pan American World Airway pilots that the military was not concerned over this matter as it was making its plan for war without reliance on civil aviation.

Quick Call for Help

Yet six days after hostilities broke out in South Korea, the military turned to the civil airlines for help. This is probably the shortest two years on record.

As this was written, the scheduled



Gets NSRB Post

Robert J. Smith, president of Pioneer Air Lines, has been nominated by President Truman to be vice chairman of the National Security Resources Board. Smith was expected to accept the appointment, which would make him No. 2 man in one of the most important of the government agencies in a time of crisis.

and non-scheduled air carriers were being required to operate, on a charter basis, 63 four-engine planes to meet the airlift requirements in the Pacific. Among the air carriers participating in these operations and the planes involved are:

Pan American, 10
United and Northwest, 2 each
Seaboard and Western, 4, plus 2 which the carrier has been leasing from Alaska Airlines
Overseas National, 4
Transocean, 6
Flying Tigers, 3
Others to be included soon in the operations are:

TWA, 4
United, 5
Capital, 2
American Airlines, 7
Eastern Air Lines, 4
Northwest, American Overseas, Braniff, Delta, National, Panagra, and Western, 1.

While it is true that the Air Force has on lease to the air carriers 38 Douglas DC-4's (C-54's) which are subject to immediate recall under the terms of the leases, the early chartering of four-engine equipment was almost double that number.

No Airline Encouragement

In fairness to one phase of the military set-up, it must be stated that the airlines have never encouraged building up MATS into an organization that would be able to furnish all of the necessary airlift in case of an emergency. The reason is obvious because in many instances MATS would

have become a competitor in the sense it would be carrying a lot of traffic that in peacetime is carried by the airlines. But this hardly explains Early's statement that use of scheduled air carriers were not considered as necessary during the first two years of a war.

In the overall it would seem that the military must have a change in its logistic concepts. Transportability of considerable numbers of men and material by air is feasible. In terms of original investment, it is costly but in terms of lives to be saved and military advantages to be gained, it might well mean much less money during the long pull.

PEOPLE IN THE NEWS

Col. Alvin B. Barber has been appointed as acting director of the National Security Resources Board's Transportation Office, following the resignation of Capt. Granville Conway as director. Capt. Conway resigned because of the pressure of private affairs but will continue to serve the Board in an advisory capacity.

J. W. (Woody) Thomas, director of governmental affairs for Trans World Airlines, has been named as chairman of the Government Affairs Committee of the Air Transport Association.

C. H. (Dutch) Schildhauer, one of the developers of the Naval Air Transport Service and long prominent in aviation, has been appointed aviation director of the Baltimore Association of Commerce.

Paul W. Cherington has resigned as executive assistant in the CAB chairman's office to do research in the economics of air transportation at the Harvard School of Business Administration.

INDUSTRY PERSONNEL

Harold H. Warden, manager of the installation department of Curtiss-Wright Corporation's Propeller Division for the past nine years, has been promoted to general sales manager of the division. Before joining C-W, he was with American Airlines' engineering

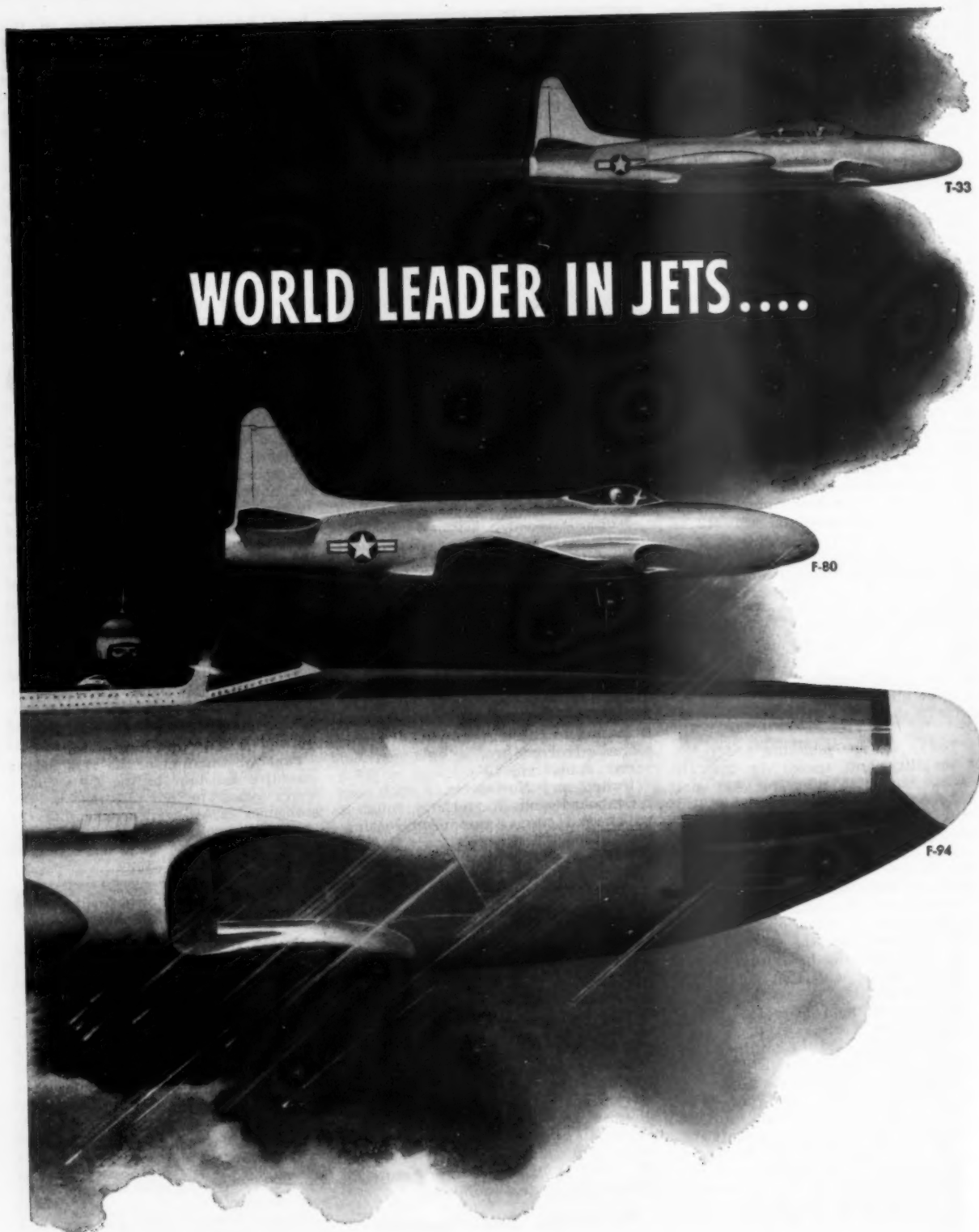


Warden

department. He replaces R. Elmer Min-ton, resigned.

Thomas Wolfe, former vice president of Pan American World Airways' Pacific-Alaska Division, has been elected president of Pacific Airmotive Corp., Burbank.

James A. Fraser, engineer flight-test pilot with the Boeing Airplane Co. since 1942, has been named staff assistant to J. O. Yeasting, newly-elected vice president-controller.



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Now, another "first" is being produced in quantity at the Lockheed jet plant. The F-94 All-Weather Interceptor-Fighter is the first production all-weather jet to go into service for the U.S. Air Force.

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PRODUCTION SPOTLIGHT

\$3.4 Billion for New Planes: Air Force Air Materiel Command is preparing firm orders for an additional \$2.7 billion in aircraft procurement from the new \$10 billion defense fund asked by President Truman. An additional \$646 million was to go to the Navy for new plane purchases. This practically doubles the procurement program provided in the fiscal 1951 appropriation bill which was still before Congress at press time.

Super DC-3's for Navy: The Navy has contracted with Douglas Aircraft Co. for conversion of 100 R4D (DC-3) airplanes to military versions of the Super DC-3. Order is said to be about \$20 million. The converted plane will have 31,000-lb. gross weight and will be powered by Wright R1820-C9HE engines driving Hamilton Standard propellers.

AF Gets C-124: The first production Douglas C-124 scheduled to go into regular operation with the Air Forces has been delivered from Douglas Aircraft Co.'s Long Beach plant to Walker AF Base at Roswell, N. M. Previous production models went to the Air Materiel Command at Wright-Patterson Field for further testing.

Inspection Plan: The Air Force is trying out a plan of curtailed AF inspection on the T-33 production line at Lockheed Aircraft Corp. and may extend it to other projects if successful. AF spot inspections are discontinued in all departments and the actual physical inspection work is performed by Lockheed inspectors only under this plan. AF quality control personnel, however, continue to check Lockheed's inspection operation.

Delayed Deliveries: Completion of delivery of the five **Convair-Liners** ordered by FAMA, the Argentine airline, is now in sight. Three were delivered last winter, a fourth was delivered a few days ago, and the fifth is scheduled to be flown to Buenos Aires this month. Argentina's dollar shortage complicated the deliveries.

Lots of Connies: Total number of Lockheed Constellations flying or on order by the airlines or military was boosted to 231 by the recent order of Aerovias Nacionales de Colombia (Avianca) for two L-749A models. Avianca also has an option to buy a third.

DC-6B's For Swiss: Two Douglas DC-6B transports have been purchased by Swissair for use in trans-Atlantic services. Delivery is scheduled in May and June of next year. Order brings to 190 the total number of DC-6 aircraft either now flying or on order by 18 airlines.

Test Flight: First production version of Northrop Aircraft's F-89 twin-jet, all-weather interceptor completed its first test flight, at Edward AF Base, Muroc, Calif. Northrop is building more than 100 of the planes for the Air Force.

Engine Debut: After completing hundreds of hours of successful ground tests, the **Avro Orenda** engine, designed to power to RCAF's Avro CF-100 fighter, has made its first flight test. The Orendas were mounted in the outboard engine positions of a specially equipped Lancaster bomber for the flight, results of which were not disclosed.

Magnesium Plane: The Air Materiel Command's Aircraft Laboratory has given a go-ahead signal to engineers working on the design of an all-magnesium-alloy plane. Tests with a Lockheed F-80 with wings made entirely of a magnesium-zirconium alloy were promising enough to warrant further development. One advantage expected is increased fuel capacity, since the un-reinforced magnesium skin may make it possible to do away with some of the stringers and chord-wise formers.

Wing Panels: Lockheed Aircraft Corp. has delivered four of the 14 sets of Constellation outer wings ordered by Eastern Air Lines, which is converting its L-649's to long-range L-749's. Panels will increase fuel capacity by 750 gallons. EAL is making the installations at its Miami base. Cost of panels is \$400,000.

Truman About-Face Climaxes Bitter PanAm-AOA Case

By ERIC BRAMLEY

(Editor's Note: See News in Brief, Page 6, for the most recent developments in the PAA-AOA merger.)

WHEN THE Civil Aeronautics Board on July 17 officially issued its Presidential-approved decision authorizing the \$17,450,000 sale of American Overseas Airlines to Pan American World Airways, it was the climax to the most bitterly-fought case that had come before the Board in its 12-year history.

For months there had been intrigue and maneuvering. Both sides, PAA and AOA on the one hand, and TWA, Seaboard & Western Airlines and a group of AOA employees on the other, called the case the "dirtiest" of all time. There was dissension and ill feeling within the Board itself.

It was a case in which President Truman okayed CAB disapproval of the sale one day and recalled his approval the next, ordering a favorable decision. One report was that Defense Secretary Louis Johnson was instrumental in persuading Truman to change his mind. Oswald Ryan, only CAB member unqualifiedly in favor of the sale, was said to have made a secret White House visit.

TWA, which fought the sale bitterly, was awarded stops at London and Frankfurt, but found itself with PAA competition in Paris and Rome. What the British, French and Italians will have to say about the new services remained to be seen. There were predictions that protests will be forthcoming.

Atlantic Set-Up Changed

What the President had done, in ordering approval of the sale, was to change the North Atlantic three-airline set-up before expiration of the seven-year Atlantic experiment. That experiment concludes in 1952, at which time CAB is to re-examine the entire situation. The amended certificates in the merger case will expire July 4, 1952.

PAA and AOA are settling the details to close the sale. PAA announced that Harold R. Harris, AOA vice president and general manager, would become PAA's vice president in charge of Atlantic services. Horace Brock, PAA Atlantic Division manager, will remain in that capacity, reporting to Harris.

On May 17, CAB decided to disapprove the sale. Chairman O'Connell and Russell B. Adams were emphatically against it. Harold Jones also disapproved in a separate opinion.

Josh Lee favored the sale but asserted that TWA should be awarded a London stop. Oswald Ryan strongly favored the sale.

The O'Connell-Adams opinion was highly critical of PAA. In strong language, it said that PAA absorption of AOA would "result in public detriment" by increasing, not lessening, the cost to the government, and would "stifle" effective competition in U. S. flag operations across the Atlantic. It called PAA's predicted mail pay savings "wholly devoid of merit" and said that over half of PAA's claimed savings was "unwarranted inflation."

Cautioned on Policies

On a number of occasions, it added, CAB had "felt it necessary to caution Pan American with respect to both its rate structure policy and its policy on capacity. The carrier's response thereto has not been such as to create any confidence or belief that Pan American would operate the merged routes in such manner as to make available to the government the benefits of any savings . . . It is clear that in order to realize the potential savings . . . Pan American would have to reverse abruptly the management policies which have resulted in the recent sharp upward trend in its break-even need."

O'Connell and Adams also touched on the situation that ultimately developed in CAB's second decision in the case. "The ultimate deleterious effects of the heightened concentration of power cannot be avoided by tinkering . . . with the carriers'

route structure. Obviously, by some re-shuffling of route segments or points, we could give rise to an immediate increase in traffic for TWA. The most important point to which we could give it access would be London . . . We should not have begun to redress the inordinate competitive imbalance, and it is to be doubted whether we should be postponing by one week the eventual undermining of TWA's international operation."

Ryan Dissents

Jones was not as emphatic. He did not believe that the record showed that PAA was trying to create a monopoly or that it would have unfair advantage over TWA. But he pointed out that the U. S. was in the midst of a seven-year experiment on the Atlantic and didn't know all the answers yet. The route pattern should not be changed, he said, without a "dispassionate" hearing and as a result of a "heated, acrimonious adversary proceeding."

Ryan disagreed completely. Asserting that "the American taxpayer emerges as the forgotten man in this decision," he said there was need for a more economic Atlantic air pattern and a need to reduce the "rising tide of subsidy." PAA's estimates of savings were "sound and, if anything, too conservative," he said, adding that the sale would not weaken TWA, which would receive a share of AOA's traffic. TWA, he stated, is "already the dominant carrier in the transatlantic service."

On June 29, President Truman approved CAB's 3-2 disapproval of the sale. The next day, however, when the decision was within hours of being released, his letter of approval was recalled. CAB sources have said that the recall came after three phone calls to the Board from Presidential Secretary Matt Connelly.

Several days later, on July 10 (in



Water Rudders—When the Martin P5M-1 Marlin flying boat was first operated in the water, the additional hull between the keel and chine (brought about by the use of a long afterbody) made the airplane difficult to maneuver in close areas. Following tank tests at the Stevens Institute of Technology, Martin installed the underwater flaps shown in this drawing to provide greater maneuverability and additional braking. Operated hydraulically by means of electrical solenoids which the pilot controls, the flaps can be extended as much as 65 degrees, individually or together. The flaps, which are protected against overspeed conditions by special spill provisions, are said to reduce maneuvering space requirements by 50%.

the meantime, on July 8, the President accepted O'Connell's resignation), CAB received a letter from Truman stating that he had decided to approve the sale, and to allow TWA into London and Frankfurt and PAA into Paris and Rome. "My objective is to accomplish a route pattern in which our nation may have the benefit of competition to the principal traffic points in Europe, and to avoid a monopoly on the part of either of the United States carriers," he said.

White House Visit

Following the President's approval of CAB's 3-2 disapproval, Oswald Ryan was reported to have visited the White House without the knowledge of his colleagues. Drew Pearson, newspaper columnist, stated that Ryan told the other CAB members the next morning that the President "had asked him to carry the oral message that he wanted the entire question of the merger reversed" and that the sale should be permitted. O'Connell, according to Pearson, hit the ceiling and wrote a "hot personal letter" to Truman protesting his "shabby treatment" and asking immediate acceptance of the resignation he had sent to the White House on June 13.

Pearson attributed the change in Truman's views on the merger to Defense Secretary Johnson, who visited the President on his yacht, and to Presidential aides Connelly and John Steelman. There have been other Washington reports that an as yet unnamed person was primarily responsible for the President's switch.

On July 10, the same day it received the Truman letter, the four remaining CAB members revised their opinion to approve the sale, and the President okayed this opinion the next day.

It was here that James M. Landis, former CAB chairman, and now a partner in the Washington law firm of Landis, Gewirtz and Maclay, stepped into the picture. Representing Seaboard & Western and a group of AOA employees (Brian O. Sparks et al) in opposition to the sale, Landis moved to stop CAB from issuing its second decision.

Restraining Order Signed

At 2:30 a. m. on July 12, Landis got District Judge H. A. Schweinhaut out of bed, presented his case, and persuaded the judge to sign an order restraining CAB from issuing anything except its original disapproval. The case, Landis argued, was not one that required Presidential approval. Such approval is required on ordinary international route cases, but this was an acquisition of control, or a sale, and, once disapproved by CAB, there was nothing on which the President could act, he said.

CAB, through the Justice Dept.,

asked to have the order dissolved on grounds that all action in the case had been completed before Landis obtained the order. In arguments before Judge Schweinhaut on July 13, the principal issue was whether a Presidential-approved order was effective as soon as signed by the President or whether it must first be released to the parties and the public. Graham Morison, Assistant Attorney General, argued that release was not necessary; Landis took the opposite view and reiterated that Presidential

approval was not necessary in this case.

During his argument, Morison inadvertently disclosed—for the first time officially—that there had been a CAB decision disapproving the sale, that the President had signed it, but later reversed himself.

The next day, George Solomon, an attorney associated with Landis, visited the CAB secretary's office and asked to look at the original 3-2 decision. After a hurried Board meeting, copies of the decision were re-

The Merger in Brief

The 19-month-old Pan American-American Overseas acquisition decision issued by the CAB on July 17 had following major provisions:

1. Sale of American Overseas Airlines to Pan American World Airways approved.

2. AOA's certificate of public convenience and necessity transferred to PAA.

3. PAA granted stops at Paris and Rome; TWA awarded London and Frankfurt (the latter until no longer required in the interests of the American occupation of Germany).

4. Amended certificates become effective 60 days after date of their approval by President Truman (July 11, 1950). They expire July 4, 1952.

5. PAA and TWA must file initial service plans with CAB for service under their amended certificates. Until CAB approves, companies cannot inaugurate service to any point under the authorizations except in accordance with the service plans in effect on the effective date of the certificates.

6. Proceeding is held open and CAB retains jurisdiction for purpose of imposing such employee protective conditions as it may find "appropriate and in the public interest."

7. No person employed by PAA or AOA in North Atlantic operations upon the effective date of this order shall be discharged other than for good cause shown until further order of CAB.

Case History

Before the decision was issued, however, it had gone through the following course of events:

Dec. 13, 1948—Merger proposal first announced, providing payment for AOA in PAA common stock. Agreement was to terminate Sept. 13, 1949.

June 24, 1949—Six weeks of hearings ended, one of the longest on record, with transcript of 3,873 pages.

Sept. 13, 1949—CAB proceedings not concluded; agreement extended to Mar. 13, 1950, with option to June 13. Amended to provide payment of \$17,450,000 cash for AOA instead of stock.

Dec. 22, 1949—Favorable examiner's report.

Mar. 1, 1950—Oral argument before Board members.

May 17, 1950—CAB disapproved sale by 3-2 vote.

June 6, 1950—PAA-AOA agreement extended to June 30 (from there on extension was a few days at a time).

June 29, 1950—President Truman approved CAB decision.

June 30, 1950—President Truman recalled his approval.

July 10, 1950—President Truman wrote to Acting CAB Chairman Oswald Ryan, stating that he had decided to approve the sale.

July 10, 1950—CAB revised its decision, approving the sale.

July 11, 1950—President Truman approved revised decision.

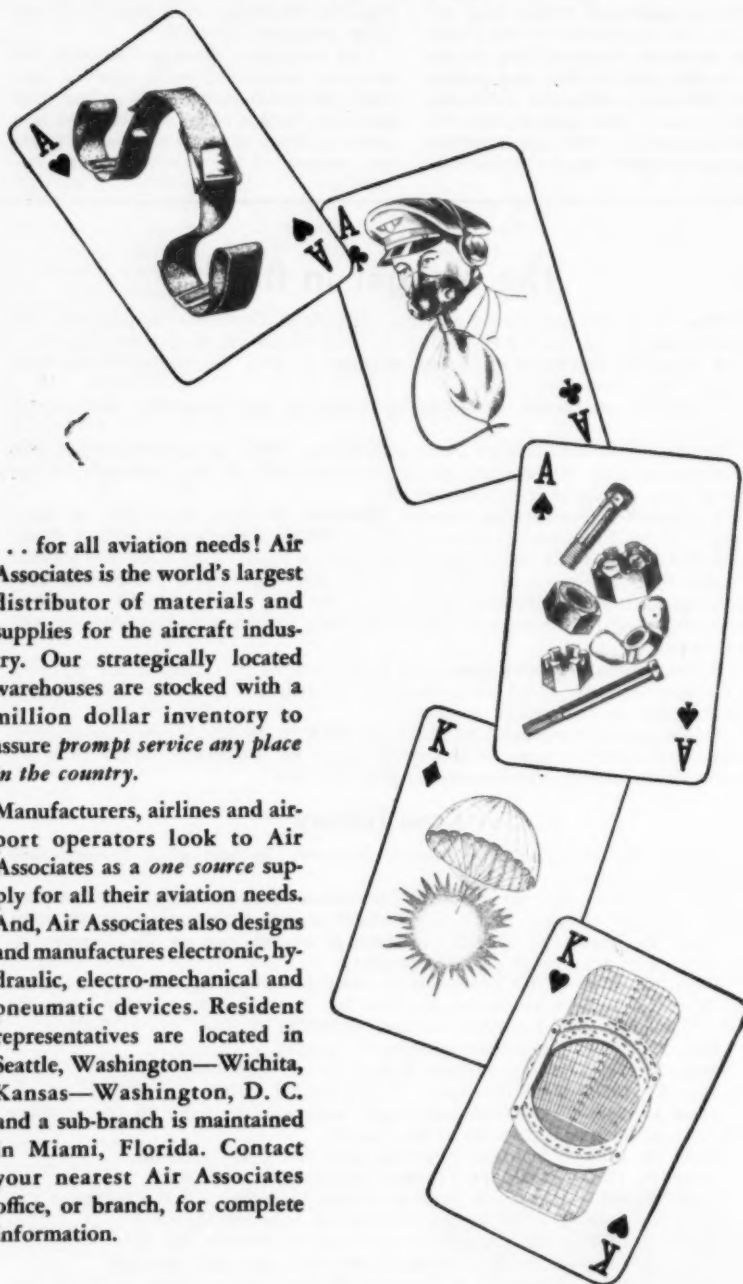
July 12, 1950—Seaboard & Western Airlines and a group of AOA employees (Brian O. Sparks et al) obtain court order restraining CAB from issuing anything except its original opinion.

July 13, 1950—Government asks to have restraining order dissolved. Argument held before Judge H. A. Schweinhaut.

July 14, 1950—CAB makes original 3-2 decision available for public inspection. Second decision also made public as part of court proceedings before Judge Schweinhaut. TWA asks CAB to stay issuance of second decision.

July 17, 1950—Judge Schweinhaut lifts restraining order; CAB issues decision approving sale, after denying TWA motion.

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leased to the public. In the meantime, the second decision was made a part of the public record in the court proceeding, which Judge Schweinhaut had under advisement.

Unique Case

Thus, for the first time in CAB history, its decision in a case was officially known before it was actually served on the parties. On the same day, TWA filed a motion with CAB asking that it stay issuance of the second decision and reopen the whole case.

On the following Monday, July 17, Judge Schweinhaut dissolved the restraining order. Minutes later, after denying TWA's motion for a stay, CAB made public its opinion approving the sale. The judge, in dissolving the order, stated that "before this court acted, the Board and the President had acted. Hence . . . the court must hold that the case is moot . . . There seems to be no reason in logic or in law why the Board cannot reverse itself. In this case it did so and the fact that it was by direction of the President is beside the point. The second decision was as much a decision as the first one . . . There is no statutory requirement for publication of an order of the Board as a prerequisite to validity."

Attorneys for those opposed to the sale were quick to call attention to an interesting point in the second decision. This decision admitted the existence of the 3-2 original disapproval but skipped over the fact that the President had ever signed it, stating only that he had "withheld his approval" and later ordered a new opinion.

Copies of the 3-2 document examined by lawyers and reporters did not include the original, and hence bore no Presidential signature. TWA told the Board that "speculation exists that the signature of the President has been eradicated therefrom or that the document itself has been physically destroyed." To date, CAB has not answered.

The fact remained that except for Morison's statement in court, there would not now be any official disclosure that the President had signed anything but the second opinion.

When the PAA-AOA combine and TWA have drawn up their service plans—how they propose to operate their amended routes—and presented them to CAB for approval, the foreign governments involved will be officially notified, through the State Dept., of the changes. It was here that some observers believed that the governments would protest against increased U. S. competition.

But even opposing attorneys were agreed on one point: despite what legal or diplomatic developments the future might bring, once a merger of this magnitude was completed, it would be next to impossible to unscramble it.

Fuel Consumption of deHavilland's Comet

By RICHARD G. WORCESTER

THE ENGLISH press has given the world a tremendous amount of information about the de Havilland Comet airliner (the publication *Aeronautics*, for instance, has practically written a book about the aircraft) but little or no data is apparently available on the fuel consumption.

If there is one crucial issue on jet transports in general and the Comet in particular, it is exactly how the pattern of fuel consumption differs from that of ordinary transports. All operational characteristics return sooner or later to this comparatively obscure factor.

This survey, which deals only with this single aspect, rounds up facts given at the IATA Asbury Park conference, by BOAC officials, representatives of the British Ministry of Civil Aviation and other well-known personalities. Integrating this data with the published Comet range and Ghost performance figures gives what we believe is a realistic picture of Comet fuel economics.

One of the difficulties encountered at an early stage in this study was how to resolve the contradictions. For example, at the IATA conference

a D. H. official gave the underwing refuelling rate as 200 gallons/min. whereas *Aeronautics* and the *D. H. Gazette* gave it as 180 gallons/min.

The makers have stated that an improvement in consumption of up to 5% can be expected with development on the Ghost turbines. D. H. has a backlog of orders which will probably keep it busy into 1954, so if anybody placed an order for a Comet now they would receive a substantially better product at 112,000 lbs. than, for instance, some of the early BOAC models at 105,000 lbs. Therefore, the 5% improvement is shown in brackets throughout the article and operators can work to the keener estimates.

Detailed plans are being worked out for the Comet to operate on the British Commonwealth routes to South Africa and east up to about Calcutta. Nowhere along these empty skyways is there any real traffic problem except at London Airport where a simple system of priority can be worked out while the whole future of air traffic control for jets is being examined by the newly established Working Party.

All being well, an experimental mail service should start between December, 1951, and April, 1952, probably using the second Ministry of

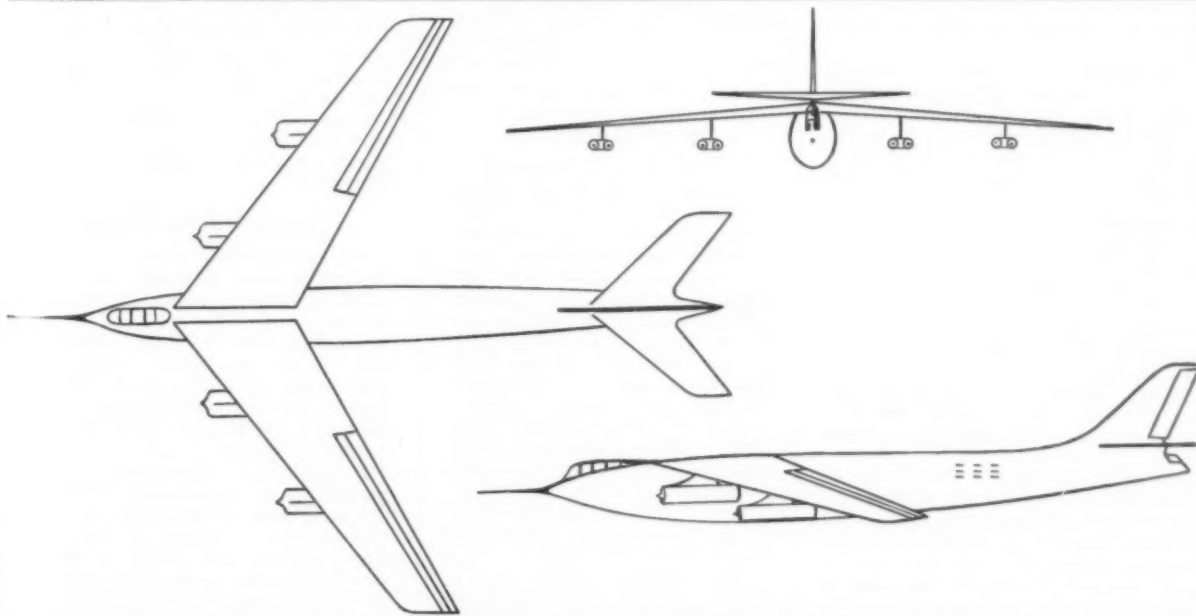
Supply aircraft, and the first BOAC model (No. 3 off the line and first with the multi-wheel undercarriage) will join it, carrying passengers some time in 1952.

How the Fuel Goes

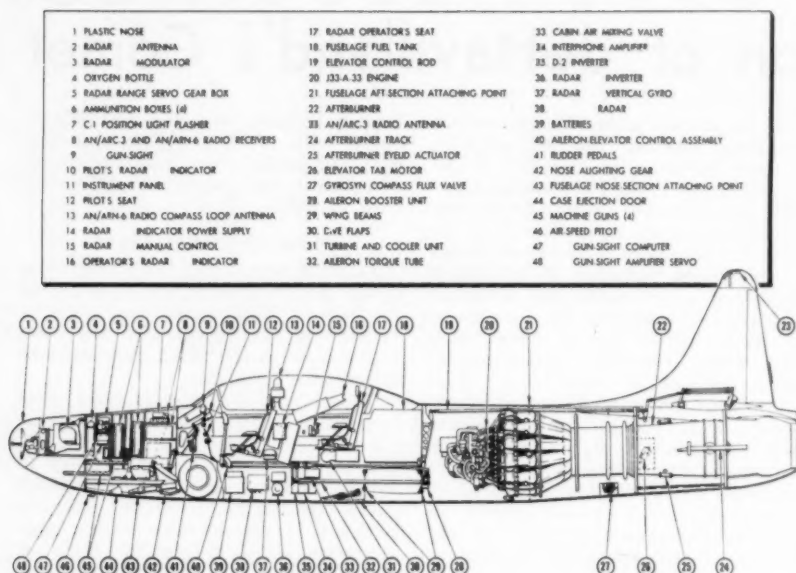
The fuel capacity of the Comet now flying is 7,200 gallons and capacity in the second and subsequent Comets (according to a speaker at the SAE conference) is increased—probably to about 8,000 gallons.

These are the approximate fuel consumption figures during a typical Comet flight. While taxiing at 30 mph. the consumption is a minimum of 13 gallons/mile but assuming stops which cause opening up, a realistic figure is perhaps 22 gallons/mile. Idling consumption is 350 gallons/hr. (332) or 88 per engine (84). For takeoff, using the Ghost specific of 1.06 lb./lb.th./hr., the consumption will rise momentarily to 3,000 gallons/hr. (2840) or 750 per engine (751).

The fuel to reach 32,000 feet, however, is not more than about 150 gallons (142). The climb can be at up to 2,050 ft./min., or 1,120 ft./min. on three engines according to D. H. A reasonable initial climb would be 1,500 ft./min. or keeping to the maker's floor angle figure of six



H-Bomb Carrier?—Several six- and eight-jet versions of the Boeing B-52 have been proposed. This one—which is likely to be the final layout—reveals the general similarity to the B-47 and YB-56. The B-52 bomber has a gross weight of 300,000 lbs., and powered by eight General Electric J-53 engines of 12,000 lbs. static thrust or 19,500 lbs. thrust with afterburning and methanol injection. This should give the bomber a speed of M.95 and a still-air range of about 6,000 miles.



Night Fighter Layout—Noteworthy points about this cutaway of the Lockheed F-94 Night Fighter is the positioning of the radar in the rear cockpit and the scanner mounting in the nose. This is probably the first time afterburning equipment has been shown drawn to scale in an operational fighter. The engine is a modified Allison J-33-A-23 centrifugal jet engine. The fuselage has been lengthened to 40 feet 1.27 inches and span is 38 feet 10.5 inches.

degrees maximum. The climbing rate would gradually decrease to about 600 ft./min. at 23,000 feet. Use of anti-icing on the climb imposes no appreciable fuel penalty as the engines are already turning at high rpm.

The leveling-off height will depend on the temperature, gross weight and stage length. Assuming a long stage length this height varies from about 25,000 ft. for the worst case at 105,000 lb. and temperature 18° above ICAN to 35,000 feet at 80,000 lb. and temperature 10° below ICAN.

Fuel consumption at a typical leveling-off altitude of 28,000 feet works out at 625 gallons/hr. (592) or 156 per engine (147) at 400 mph. TAS which gives an amp of .64 (.67). The indicated speed range here is about 105-270 mph. This fuel situation will gradually improve until at 40,000 feet the aircraft will be using 580 gallons/hr. (550) or 145 per engine (138).

Using the D. H. figure of 485 mph. TAS this works out at .835 amp (.88). Indicated speed range here is smallest from 110 to 260 mph. and the limiting factor may be the service mach number of about .8. The point to remember about the Comet is that the main body of the flight will be done at this amp figure which is not far short of the best piston engine figures of around 1.0.

Having gradually reached 40,000

feet while cruising (or anything up to nearly 45,000 feet if the temperature is much below ICAN and the weight is low) the descent must be started correspondingly earlier. Estimates cheerfully ranging from 200 to 400 miles have been given—probably about 300 miles from home is the

Comet Guarantee

In these days of "cost-plus" it is seldom that a British manufacturer will guarantee anything, even on a conventional airplane. de Havilland, however, has guaranteed—with penalty clauses—the speed, still-air range, payload and delivery dates of the Ministry of Supply and BOAC Comet fleets. So far as can be ascertained, the guarantees are as follows:

Still-air range 3,500 miles with 6,000-lb. payload. (The London-Cairo flight was 2,200 miles with 8,000-lb. payload).

Speed at least 465 mph. TAS (The Comet has repeatedly flown about 500 mph.).

The delivery dates of the BOAC aircraft are not known; a reasonable guess is that they range from the first transport around the middle of 1952 to the last one some time in 1954.

point when the descent would start, slowly, at about 450 ft./min.

At this stage if there is an airport delay of one hour the pilot can use the descent to maximum advantage and the penalty would be not more than about 300 gallons (285), which works out at only 75 per engine (71) or considerably less than the ground idling consumption. This figure is of special interest because it is the one airport holding situation in which the Comet fuel consumption compares closely with that of equivalent 100,000-lb. piston-engined transports.

If anti-icing equipment is used during 50 miles of its descent D. H. says the penalty arising from the increased engine rpm. is 150 gallons (this figure is unlikely to be reduced with engine development). The gentle descent would be continued until the pressure system has built the cabin up to sea level conditions at 20,000 ft. at which the aircraft can descend at any rate up to the floor angle of -4 degrees which D. H. recognizes as the point above which passengers tend to get disconcerted.

At this altitude the consumption is 830 gallons/hr. (790) or 208 per engine (197) at 350 mph. TAS or .42 amp (.44). The descent can be anything up to about 3,500 ft./min. and at 5,000 feet the pilot would check the descent, close the dive brakes and prepare to enter the airport circuit. Here the consumption is 900 gallons/hr. (855) or 225 per engine (214) at 270 mph. TAS and amp is .3 (.32).

When the aircraft comes down to sea level and the pilot does a balked landing procedure he flies at 190 mph. TAS using 1,100 gallons/hr. (1050) or 276 per engine (262) giving an amp in the worse case of .17 (.18). The speed range here is 95 to 350 mph. indicated.

Temperature Effects

The penalty for cruising at 2,500 ft. below the optimum—say when ducking under a jet stream—is about 84 gallons/hr. (79) and the increase in consumption with a temperature rise 15 degrees above ICAN is 96 gallons/hr. (91). The fuel expended coming down to airfield level and returning is 240 gallons (228). All these are D. H. figures.

In the three-engine case the fuel penalty from the drop in altitude is 135 gallons/hr. (127) with the three live engines running at the same speed. If they are opened up to hold the altitude the increase is about 18% or translated at 28,000 feet this is 552 gallons/hr. (525) from the three. However 28,000 feet is about the three-engine ceiling. At 85,000 lb. the two-engine climb is an average of 800 ft./min.

World's Pure Jets

The distribution of U. S. jet engines, shown in bold face, among the list shows that this country is currently developing a greater variety of engines than any other. The table is intended only to give an approximate overall picture and no attempt is made to place the engines exactly in their correct thrust brackets because many of them like the General Electric J-47 and the Rolls-Royce Avon have a wide range of dry thrust ratings. The figures in brackets indicate approximately the augmented ratings, which include afterburning, and the wet rating where this is known.

Dry thrust static rating (lbs.)

	Engine
100	Boeing 500
500	Turbomeca Pemene
1,000	Armstrong Siddeley Adder 1
1,500	Westinghouse J-30
2,000	Rateau SRA 101
2,500	Avro Chinook Shvetsov "Jumo 004H"
3,000	Westinghouse J-34 (5,000 lb.) D. H. Goblin 2 (3,500 lb.)
3,500	Rolls-Royce Derwent 5 (4,000 lb.)
4,000	D. H. Goblin 4 Metrovick Beryl 2 Westinghouse J-40 Allison J-35 Allison J-33 (4,600 lb.)
4,500	Shvetsov "RB-45" ATAR 101 (French)
5,000	D. H. Ghost 1 Rolls-Royce Nene 1
5,500	D. H. Ghost D. H. Ghost (mil.) P & W J-42 Nene (7,000 lb.) General Electric J-47 (8,000 lb.)
6,000	Westinghouse XJ-46
6,500	P & W J-48 Tay (8,000 lb.) Rolls-Royce Avon 1 Avro Orenda (8,000 lb.)
7,000	Allison J-35-development
7,500	Shvetsov ASH-series
8,000	Armstrong Siddeley Sapphire
8,500	Rolls-Royce AJ-85
9,000	Bristol "pilot development"
10,500	Rolls-Royce AJ-105
11,000	P & W J-57
12,000	Allison project
13,000	General Electric J-53 (19,500 lb.)

Design Trends

By Richard G. Worchester



THERE IS an undercurrent of anxious feeling in many free countries that the knockabout world of commerce is not an entirely satisfactory atmosphere in which to struggle with the design complexities of evolving modern electronic-jet and rocket weapon carriers. The work is so solemn (thus the argument runs) and the achievements so vital to the future of mankind that somehow the companies engaged in the various defense programs should be protected from the unpredictable ups and downs of the financial barometer.

This habit of thought is plausible rather than convincing because, like some malignant diseases, the cure is apt to be more dangerous than the condition. An organization like North American for instance with but one customer—the AMC—might be regarded as in effect an arsenal. But the word arsenal in many people's minds spells subservience, sterility and servitude—none of which has any relevance to a company which can turn out a superlative weapon like the F-86. Another point which is easy to overlook is that the fusion of electronics, supersonics and nucleonics is getting beyond the capacity of many aircraft companies unless their spread of design knowledge becomes wider than it is now. This has tended to keep these lines of research together under one roof as it were, by entrusting advanced weapon development to industrial giants whose economic stability is tied closely to the overall prosperity level of the country.

Scientific workers have long understood the moral risks and repugnance of research conducted on the secrecy level apparently considered essential at places like Oak Ridge, Hanford and Los Alamos. Technicians have indeed taken the unusual—if not unprecedented—course of expressing these feelings in public. They have felt with David Lilienthal the stifling effect of monopoly when it reaches the stage of stamping as secret papers and equipment which can be bought by the public. If there is one terrifying lesson the world has learned from Russia, particularly as a result of the Lysenko controversy, it is that the industrial strength of a country lies in its design and inventive genius. For this to work freely it demands the wholehearted participation, support and encouragement of free discussion in the recognized open forums such as the scientific institutes, the technical press and so forth. Technological decadence follows from acts of industrial isolation and unnecessary secrecy as inexorably as night follows day.

The basic principle of the military and civil operators asking for what they want and leaving the manufacturers to provide it, has long been accepted as the basis of aircraft procurement. This is a good system so long as the people who write the specifications know how to frame them as a challenge to industry. The system becomes a thoroughly bad one when, as sometimes happens, the operators hold the carrot either so near that it is promptly grabbed and eaten by the donkey or else so far away that he cannot see it. Intuition is needed to lay down exactly the right requirements but this alone is not sufficient. A long and deep knowledge of the most searching technical problems is a vital prerequisite which the specification writers must possess. Take for instance the broad question of payload; in order to decide this the planners must have in mind a structure-to-gross weight ratio. But only an intimate understanding of a labyrinth of integrated mathematics on the strength of future materials can throw up a structure weight which will provide industry with the successive emotions of amusement, doubt, hope and conviction which combine the essence of a good "carrot."

The needle nose, no doubt, has its value for supersonic aircraft but the rash of sharp entries on slower production models is in some cases the product of the artist rather than the scientist. Lockheed, however, designed the side intakes of the XF-90 to marry with the long needle which is the best platform for the airspeed indicator pressure head. Of the eight sonic and supersonic aircraft designs, four have rounded noses.

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Company's Twenty-fifth Anniversary

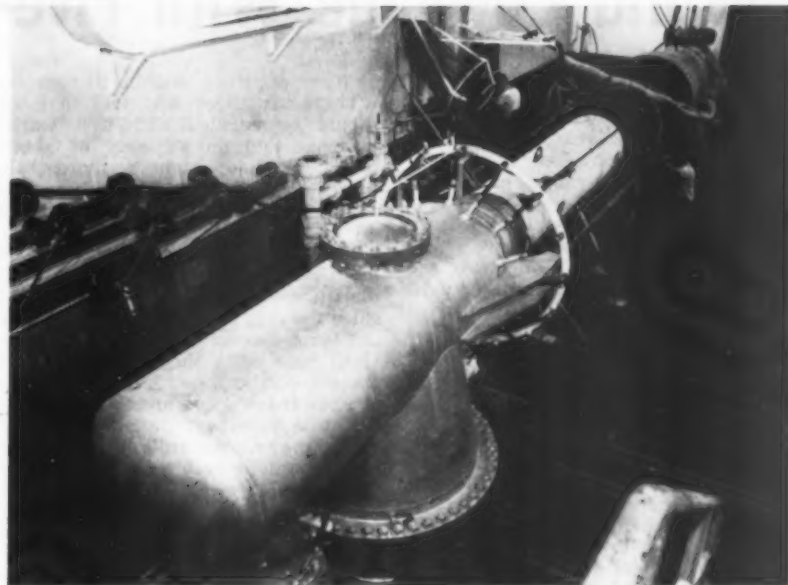
TWENTY-FIVE years ago, Frederick B. Rentschler founded Pratt & Whitney Aircraft with the object of "designing, constructing, testing and experimenting with aeroplane engines, aeroplanes, hydroplanes, etc., and if successful to proceed with the production thereof."

On July 26, Pratt & Whitney marked its 25th anniversary by ceremonies which included a tour of the company's plant at East Hartford, Conn., for press and military observers. Lt. Gen. K. B. Wolfe, USAF Deputy Chief of Staff, Materiel, and Rear Adm. Alfred M. Pride, Chief of the Navy's Bureau of Aeronautics, were to be on the program as guest speakers, along with Rentschler, now board chairman of United Aircraft Corp., P. & W.'s parent company, William P. Gwinn, general manager of P. & W., and H. M. Horner, United Aircraft president.

Highlight of the program was the formal dedication of the company's new \$12,000,000 jet engine research and development laboratory, the largest privately-owned jet research facility in the world. To be known officially as the Andrew Willgoos Turbine Laboratory, honoring the man who served as P. & W.'s chief engineer from the company's founding in 1925 until his death in 1949, the laboratory was dedicated by vice president-engineering of United Aircraft Leonard S. Hobbs, Willgoos' long-time close associate in P. & W. engineering activities.

The new laboratory, with power generating capacity up to 80,000 horsepower, has four test cells in which engine components and complete engines may be tested. It was designed primarily to apply P. & W.'s philosophy of component testing; the company feels that refinement and improvement of components offers the biggest pay-off, as evidenced by the 30% power increase they were able to get in the new J-48 jet engine without changing the dimensions of its predecessor, the J-42.

To provide the tremendous power required for jet testing, the laboratory



IN THIS burner test cell, one of four test cells in the laboratory, hot or cold, dense or thin air can be pumped to simulate operating conditions over a wide range of altitudes. This cell can be used for testing burners or complete engines. Special silencing chambers meter all air into and out of the test cells to reduce the noise to the lowest possible level.

has an array of marine power plants, including four boilers originally built for Navy cruisers and four turbo-generators from surplus destroyers. The four generators turn out a total of 18,400 kilowatts, enough to supply a city of 150,000 with light and power.

The laboratory also has a pump house which pumps 120,000 gallons of water a minute through the test cells and a complete noise muffling system. The facility will be operated by the engineering department under Engineering Manager W. A. Parkins and Chief of Experimental Laboratories B. A. Schmickrath.

Also included in the anniversary observance was a display of the latest P. & W. engines and a full power demonstration of the J-48 engine, the most powerful jet in U. S. service.

Besides the J-48, Pratt & Whitney is now building, in production quantities, the R-4360 Wasp Major piston engine, power plant for such airplanes as the Convair B-36, Fairchild C-119 Packet, Douglas C-124, Boeing C-97 Stratofreighter and others. The company also has an experimental turbo-prop engine, the PT-2, which develops in the neighborhood of 6,000 horsepower, and a new Air Force high-thrust axial-flow turbo-jet engine, the J-57.



LARGEST privately financed jet research facility in the world, this \$12 million test laboratory was dedicated on July 26th by Pratt and Whitney Aircraft. The building is 12 stories high and has no windows. It will be used for testing complete jet and turbo-prop engines as well as smaller engine components.

Long-Range Navigation Target . . .

World Coverage With Five-Mile Accuracy

By WILLIAM D. PERREAULT

WHILE the United States is now on record as favoring the use of Loran and high-powered beacons as the standard long-range navigation aids of the future, there is good reason to believe that this stand will be abandoned in the near future. The reason: studies now underway are expected to show that neither will meet the basic objectives of such a system.

In an attempt to establish a sound U. S. policy on this vital subject, the Radio Technical Commission on Aeronautics has assigned Special Committee 50 to carry out an investigation as suggested by the Air Navigation Development Board and the Air Coordinating Committee. This group, chairmanned by ATA's Vernon Weihe, is to determine what is required of these systems in the way of accuracy and range, what systems are available and how each meets the basic objectives.

Objectives

As presently visualized, the target long-range navigation system must be capable of providing world-wide coverage. This does not mean that the system would be installed on a world-wide basis immediately but rather that it must be capable of expansion to this degree. Within its range limitations, the planners feel that it should be able to give them

position accuracy within five miles.

There are those who feel that we should be satisfied with 60% world coverage and an accuracy of about 20 miles. These might be more realistic figures in the light of present-day knowledge of the associated problems.

The system which is adopted as the U. S. standard must serve both maritime and aeronautical needs since the cost of such a program rules out the use of duplicate systems. Until now, with the knowledge that the aeronautical services were working toward world-wide coverage and five-mile accuracy, the maritime interests have apparently been willing to accept their findings. This may not be true if the final objectives are altered.

The current choice of Loran as the U. S. standard is readily understandable. The U. S. has 30 Loran stations in operation with an estimated investment of about \$90,000,000. Several other countries including Canada, Great Britain, Denmark and Iceland are also operating a total of six stations. The U. S. stations cover the Atlantic coast from Greenland to Florida and the entire west coast up into Canada. Other stations in the Pacific provide reasonable coverage over prime routes as do those in the area of the Bering Sea and North Pacific.

It would appear logical to try and salvage this system. But the simple

fact is that standard Loran can not provide world-wide coverage and consequently is unsuitable for the target system. An intelligent choice of a target system may not be possible this year but certain facts are apparent which should put the U. S. on the right path. As in all long-range planning, it is difficult to give the proper weight to systems which are experimental or which have limited operational experience when compared with systems as widely implemented as Loran.

It is critical that these evaluations be given immediate consideration so that efforts may be directed in the proper channels. While the shape of the target system is still an unknown, enough is known to insure that an interim system capable of economic transition to an ultimate system will be developed. Otherwise important funds and talent will be diverted into short-term cures.

Several fundamentals of an efficient long-range navigation system might be helpful in such an analysis. Both the interim and target systems should have these objectives in mind:

- (1) **adequate range** (over 1500 miles) to permit the use of the smallest possible number of stations,
- (2) **it should require a minimum** amount of supervision and no active operational personnel,
- (3) **airborne instrumentation should** be as simple as possible consistent with basic objectives,
- (4) **a single station should** be capable of providing useful intelligence to the pilot, and
- (5) **it should be capable of both** land and sea coverage.

Navigator Needed

Loran, like the British Gee system, uses a complex and weighty cockpit presentation. It is considered that a navigator is required to make efficient use of the system. Data interpreted from a lighted scope must be transferred to charts to locate the airplane's position. To get a reading of the airplane's line of position usable signals from at least two sets of stations must be received. To get a specific airplane fix along this line of position, signals from at least three separate stations must be obtained.

It costs over \$1,000,000 to install a typical Loran station. Once installed some 12-14 men are generally required to man the station. Unlike most radio beacons, active opera-

New Number—The first Martin 2-0-2A is shown here during takeoff on its initial flight test. TWA has now taken delivery on the first airplanes of a group of 12 scheduled for delivery prior to the winter season. Although primarily the same as NWA's Martin 2-0-2's, the 2-0-2A's will have improved engines and higher gross weight. The basic airframes were in various stages of sub-assembly when the TWA-EAL-Martin contract was signed in early March.



Prominent Systems of Long-Range Navigation

System	Present Status	Range	Accuracy	Cockpit Presentation	Airborne Unit Weight	General Classification	Base Line	Minimum Stations Required	Frequency Band KC.
Low Frequency Omni-Range	Three stations erected in U. S. One now operating. Tests continuing	Up to 2,000 miles, depending on station power and antenna. (See high power beacons)	Preliminary reports indicate unacceptable	Left-right indicator and frequency selector	65 pounds minus instruments and cables	Azimuthal	Short	1	Ultimately 365-415 Now 110 to 365
Decca	Widely implemented by British in English Channel and North Sea—primarily marine	240 miles with accuracy within 40 feet	Extreme accuracy (see range)	Four dial-type indicators. Simple to read but bulky	About 75 pounds	Hyperbolic	Long	2	70-126
Standard Loran	Present U. S. choice for Target system. 36 stations now operating—6 foreign	700-1,500 miles over water, 200-500 miles over land, high at night	About 2 miles within usable range	Data must be interpreted from scope-type unit. Complete and bulky	125 pounds	Hyperbolic	Long	2	1800-2000
Low Frequency Loran	Experimental	About 1,200 miles	Equal to Loran	Same as Loran	About 125 pounds	Hyperbolic	Long	2	180
Lorad	Paper system	Same as Standard Loran	Unknown	Pulse direction finder	Very light	Azimuthal	Long	1	1800-2000
Lorac	One system now in use in U. S. by an oil company.	Unknown	Considered good	Similar to Decca	Unknown	Hyperbolic	Long	2	70-126
Gee	Widely implemented. Considered present-day British standard	Line of sight—About 150 miles at 10,000 feet	About one mile in 250 miles range	Same as Loran easier to operate	70 pounds	Hyperbolic	Long	2	20-85
Consol (sonne)	One trial installation in U. S. by USAF. British version at Bushmills, Ireland and Strayenger, Norway	2,500-3,000 miles now indicated	Outstanding results to date. Best yet at long ranges	No instruments. Standard radio receiver, clock and uses special charts	No increase	Degenerate Hyperbolic	Medium	1	185
Divaz	Paper System. Instrumentation	Consol with Same as Consol	Assumed about equal to consol	Left-right indicator	Unknown	Degenerate Hyperbolic	Medium	1	180
Naviglobe	One experimental station at Belmar, N. J.	About 1,500 miles	About one degree	None at present. May use left-right indicator	Undetermined. Estimates as low as 35 pounds	Hyperbolic	Short now, may go to medium in future	1	90-110
Radox	Paper system developed by U. S. Navy	2,000-2,500 miles	Navy estimates 5-mile accuracy at 2,500 miles	Dial-type instrument. Exact form undetermined	About 100 pounds	Hyperbolic	Long	2	Below 125
High Power Beacon	Widely used in the U. S. and abroad	700-1,500 miles, normal ideal conditions: to 2,000 miles. Not consistent accuracy	As much as 6° error at long range. Poor night accuracy	Standard receiver and direction finder	Standard equipment	Azimuthal	Long	1	100-1750
Post Office Position Indicator (POPI)	Development work was started in Britain but not being continued	250 miles	Estimated five miles	Undetermined	Unknown	Hyperbolic	Might be adapted to any type	2	275

Manufacturing a

Size, speed, range, payload and power of military and commercial aircraft have increased tremendously in the past two decades. And each new installation has required a more complex, more efficient propeller.

This steady progress in the propeller art has multiplied the problems of the manufacturer a thousand-fold. So, we'd like to tell you a little of the story of these problems as they are handled by Hamilton Standard, the nation's leading supplier of propellers.

Here's one simple measure of the growing complexity of the task. From 1930 to 1950, the number of pieces in a typical propeller assembly increased from 29 to 2,220. In the same period, the number of man-hours required to turn out one propeller went up to 1,100%.

This evolution of the propeller from a simple product to a highly complicated mechanism has called for progressively better machines and new manufacturing techniques. Many of these techniques and machines are unique in all industry.

In addition to its complexity, its watch-like precision and its delicate balance, each propeller installation must be improved almost constantly to keep pace with the advances in aviation. This requires continual readjustment of production lines and new tools. And all of this must be done without disrupting delivery schedules.

Beyond all this, the production team must make a multitude of blade and hub combinations because each new airplane type demands a propeller different from any other. To meet airplane manufacturers' requirements, Hamilton Standard is equipped to manufacture propellers ranging from 7 feet in diameter to 20-foot giants, and capable of absorbing from 185 h.p. to 10,000 h.p.

Hamilton Standard accomplishes all these difficult tasks efficiently and economically, even in relatively low volume operations, through the use of highly flexible production processes. They include machines that are standard in industry, special-purpose, high-production machine tools, and revolutionary new ones peculiar to propeller making.

It takes a competent, well-integrated team of tool designers, production engineers, purchasing and traffic experts, machine operators, inspectors, machine maintenance specialists and many other technicians to keep production flowing smoothly. Hamilton Standard's position in the industry is a tribute to the skills of its production team.

a modern propeller

WHICH OF THESE MATERIALS ARE USED IN A PROPELLER ASSEMBLY?

- ☐ Rubber?
- ☐ Glass?
- ☐ Nylon?
- ☐ Silver?



Hamilton Standard's hollow steel propeller, one of the most notable advances in aviation history, is compounded of more than 50 materials, including all those listed above. A synthetic rubber with a nylon flock filler serves as a stiffener in the hollow steel blade. Glass? Glass cloth is used to hold resistance wires in place for blade de-icing. Silver? Silver alloy is the brazing material that joins shell and core of a hollow steel blade. Aluminum alloy, copper and silver alloys, steel, leather, brass, lead, zinc, cadmium, solid and foam plastics are among other propeller materials. It takes a wide variety of machines and equipment to process them, but most important ingredient of all is the skill of the employee with the knowledge to process these materials.

HOW MUCH STATIC UNBALANCE IS ALLOWED IN A 16 1/2 FOOT PROPELLER?

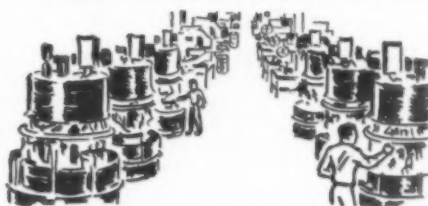
- ☐ 5.0 Inch-pounds?
- ☐ 3.0 Inch-pounds?
- ☐ 1.0 Inch-pound?
- ☐ .7 Inch-pounds?



The amount of unbalance permitted varies with each propeller and each blade. But it is very small in every installation, regardless of size or weight. For example, one of Hamilton Standard's propellers has a diameter of 16 feet 6 inches and weighs about 700 pounds. Yet its static unbalance cannot exceed seven-tenths of an inch-pound. This is equivalent to about 1/10 of an ounce applied at the tip of the blade. But testing for static balance alone is not enough. In addition, every propeller off the Hamilton Standard production line must be carefully balanced both dynamically and aerodynamically.

HOW MANY MACHINES ARE USED BY HAMILTON STANDARD'S PRODUCTION TEAM?

- ☐ 323?
- ☐ 523?
- ☐ 723?
- ☐ 923?



New tools, new facilities are needed constantly to maintain leadership in an industry that moves as fast as aviation. In addition to thousands of hand tools, Hamilton Standard has, at the moment, 923 machines to produce its numerous, tailored propeller installations. They range from standard tools used in all industry to such tools as two-story-high lithium furnace-presses and a large special tube reducing machine which is unique in manufacturing. Many of Hamilton Standard's tools are designed by its own engineers. There is a constant problem of machine obsolescence, dictated by the need for better machines. Hamilton Standard, therefore, has a highly skilled staff that knows exactly when it pays to buy a new machine, to adapt an old one to do a different job, or to figure out a new one.

HOW MANY SUBCONTRACTORS AND VENDORS SELL PRODUCTS TO HAMILTON STANDARD?

- ☐ 94?
- ☐ 194?
- ☐ 994?
- ☐ 1,494?



In addition to its own manufacturing facilities, Hamilton Standard depends on the special skills and manufacturing techniques of many subcontractors and vendors who supply materials and parts for its propellers. Through close cooperation and the constant interchange of production "know-how", Hamilton Standard has developed a team of highly skilled suppliers, who contribute importantly to our current production and comprise a valuable nucleus for expanding output in the event of a national emergency. All told, there are 162 manufacturers, both large and small, who provide us with some manufactured parts for propellers. In addition, there are 1,332 other businesses from whom we buy a wide variety of other goods and services.

HAMILTON STANDARD
EAST HARTFORD, CONNECTICUT
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



TECHNICAL NEWS DIGEST

• **CAA has awarded a contract for VHF aircraft direction finders to Bendix Radio Corp.** The \$394,500 contract covers 44 installations with the first unit scheduled for delivery next July. The ADF's are designed to be used with surveillance radar systems in such a manner that a line of light appears on the surveillance scope when communications are carried on between the aircraft and center. This line of light pin-points and identifies the airplane.

• **An international licensing agreement** under which Redifon, Ltd. of London, England, will manufacture the Curtiss-Wright-Dehmel trainer for European countries and other friendly allies has been signed by the Propeller Division of Curtiss-Wright Corp. First simulator to be built by Redifon will be delivered to British Overseas Airways Corp. It is a Boeing 377 simulator similar to that on which BOAC trained its crews at PAA facilities.

• **The Sikorsky S-52-2 helicopter**, the larger, ambulance version of the S-52-1, has completed its first flight test. The S-52-2, designated the YH-18A by the Army Field Forces, is powered by a 245-horsepower Franklin engine mounted at a 30-degree angle behind the cabin. High speed at sea level will be about 118 mph. and range about 415 miles.

• **A patent has been granted Erie Meter Systems**, Erie, Pa. covering a hydrant method of delivering gasoline to aircraft at selected points along the runways. Patent 2,507,597 also covers utilization of mobile dispensing units for connecting the hydrants and aircraft.

• **Du Pont Company's Polychemicals Dept.** has announced that Rulan, a flame-retardant plastic with electrical properties comparable to polythene, is now available in commercial quantities and is being offered to the wire and cable industries.

• **The Cleveland Pneumatic Tool Co.**, Cleveland, Ohio has been licensed by Dowty Equipment Limited of Cheltenham, England to manufacture the Dowty liquid spring shock absorber for aircraft undercarriages. One strut of this design fabricated in England is now at Wright Field being tested for the Convair B-36.

• **In an accelerated service test** on a modified type of oil pump for the Allison J-35 engines, 15 Republic F-84E Thunderjets flew a total of 750 hours in one week's time. One aircraft actually logged 23 hours and 5 minutes in 24 hours while another group of five logged 105 hours and 45 minutes in a similar period. Five airplanes in one group logged 20:35, 20:50, 22:20, 22:25 and 19:35 hours during the most successful 24-hour period.

• **Lockheed Aircraft Corp.** announced price reductions up to 20% on fabricated spare parts for the Constellation. Average over-all reduction has been computed by Lockheed as 14%. Prices were effective July 10.

• **The Aircraft Industries Association**, recognizing the industry-wide importance of the interim and long-range programs of air traffic control and navigation, has become a member of the Radio Technical Commission for Aeronautics.

• **A new firm known as Air Cruisers Co.** has purchased the plant equipment, engineering data, records and patents of Air Cruisers, Inc., well-known manufacturer of flotation gear, air-sea rescue equipment, etc. President of the new company is James F. Boyle, formerly president of Air Cruisers, Inc.

• **The name of the Ranger Engines Division** of the Fairchild Engine and Airplane Corp. has been changed to Fairchild Engine Division.

• **ATA has announced the winners of its annual airline employee's contest** in the field of research in meteorology and dispatching. First prize of \$250 went to Hubert B. Visscher of EAL, second prize of \$150 to S. R. Frank of TWA and third prize of \$100 to Robert D. Roche of Eastern Air Lines.

• **Edwin L. White**, chief of the Aviation Division of FCC, has been appointed chief of its new Safety and Special Radio Services Bureau. White joined FCC in 1930.

tional personnel, not merely maintenance personnel, are a must. Because of its short-range characteristics, the number of stations required for adequate coverage is very high.

For example, assuming 60% world coverage is desired with five-mile accuracy, it would be necessary to install over 5,000 of these standard Loran stations. This is impossible because of radio frequency problems as well as limitations imposed by inaccessible land masses where stations can not be maintained.

Instrumentation

The question of instrumentation for long-range navigation systems can be compared to the old ILS-GCA feud. The Instrument Landing System was opposed by some because it required special airborne receivers and instruments. The radar-operated ground controlled approach system provided the pilot with equivalent information but by the simple use of standard communications receivers.

Long-range navigation data during the interim period can be supplied in such a manner that operators of both large and small airplanes can use it with no more special equipment than a standard radio receiver. Consol is a system which typifies this arrangement. In the target system it will be desirable to have cockpit instrumentation and the simplicity in airborne equipment will disappear. It should be noted however that the transition from a system such as Consol to a suitable target system can be accomplished with a minimum disruption of service and a proportionately small cost.

It should not be assumed that the lightplane operator has no use for long-range navigation. With VHF omni-range navigation limited to line-of-sight, a simple electronic system of long-range navigation would find considerable use in this group.

13 Systems

The accompanying chart attempts to display the critical characteristics of various systems in a simple form. It might be noted that 13 systems are considered here. Use of the conventional octant and the less conventional self-help aids (radar) are not discussed. It has been said that almost any engineer familiar with the basic operation of these systems can design a "new" system in a day's time. It is true that these systems represent a major cross-section of the principles involved and that new systems are a matter of juggling mechanical and electronic equipment to attain end results of slightly varying nature.

It might be noted that the systems are classified as azimuthal or hyperbolic. This has numerous im-

plications. Basically it can be said that hyperbolic systems get their intelligence from more than one station while azimuthal systems will supply intelligence from a single installation. The hyperbolic system requires two stations to give line-of-position information and at least three to give aircraft fixes.

Hyperbolic systems have greater accuracy than azimuthal systems but are subject to ambiguities not found in the latter. The hyperbolic systems produce identical indications in more than one position and some means has to be used to eliminate this ambiguity. In a typical system, Decca, this is accomplished by an instrument which identifies the lane, a method of isolating the other readings to a specific compass segment.

Azimuthal systems, such as low-frequency omni and Naviglobe are not subject to ambiguities but they do suffer from lack of accuracy. Two trends might be noted as a result of these system weaknesses. There is a tendency, such as described in Decca, to design multiple systems which use hyperbolic design for accuracy supplemented by an azimuthal system to defeat ambiguities. There is also a trend toward degenerate hyperbolic systems. This, as noted on the chart, is the case when Naviglobe is used with a medium base line, with Consol and with Divaz.

Base Lines

Long base lines contribute to accuracy. The manner in which lines of position transmitted by the ground station intersect to some extent govern the ultimate accuracy of the system. When lines of position cross at right angles the greatest accuracy is possible. A system with long range can be more readily adapted to insure that the lines of position cross in the most favorable manner.

At this time it is impossible to make an informed choice of a target system, too much depending on the results of tests now being conducted. The systems listed on the accompanying chart are in effect a list of systems under consideration for interim use. Quite likely the ultimate system will be a composite of several of these systems and the choice of an interim system should be based on an informed assessment of the ability of the system to undergo a smooth transition to the target aid.

Of the systems listed here some of the more promising are Naviglobe, Consol and Radux. At the present time Naviglobe is a short-base-line system but if adopted for interim use would probably be altered to a medium base line. Some difficulties may be experienced in the transition from short to medium base lines which will affect the future of the system, other-

wise it may be a strong contender for the interim choice.

Consol is now producing remarkable results. The station at Redbank, N. J., has been picked up by U. S. airline planes with consistently good accuracy at ranges of 1,200 to 1,500 miles and with above-average accuracy as far as 3,000 miles.

Consol

In using Consol the pilot simply tunes in his regular radio receiver equipment to the station frequency, about 200 KC, and times a set of signals heard there on his clock. These signals are transposed to a set of special charts where they show the aircraft position.

A lighthouse-type aid, originally developed by the Germans and later modified by the British, the American version of Consol is another prime contender for an interim system capable of world-wide coverage and efficient transition.

The RTCA SC-31 program does not make provisions for long-range navigation aids but there is considerable hope that the long-range navigation requirements will be completed before the RTCA's target date of 1963. By proper choice of an interim system this will be greatly facilitated and the ultimate cost to the government and users will be substantially reduced.

AMONG THE SUPPLIERS

Francis E. Fairman has been appointed general sales manager of General Electric's Large Apparatus Divisions with headquarters in Schenectady, N. Y. New general sales manager of Small Apparatus Divisions is Arthur W. Bartling, who will be located at Lynn, Mass.

Emil P. Knapp, formerly assistant chief engineer of the Square D Com-

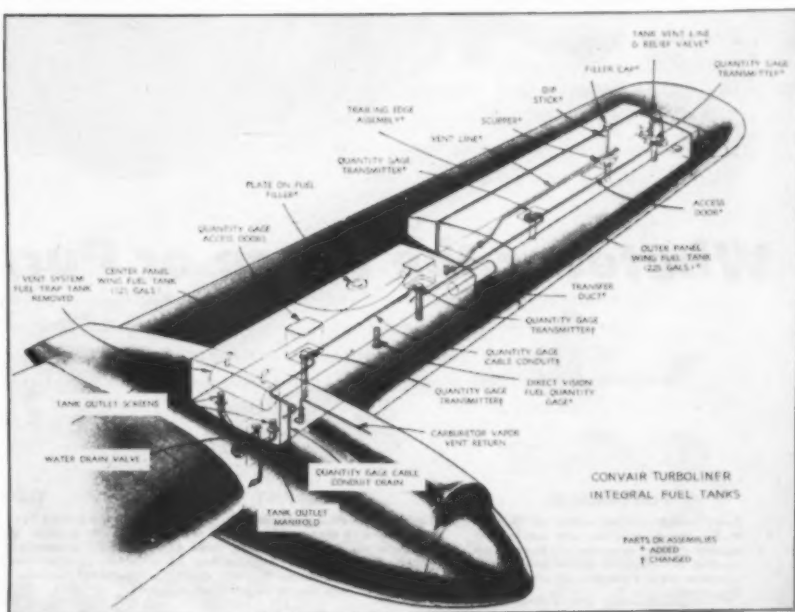


Knapp

pany's Kollsman Instrument Div., Elmhurst, N. Y., has been appointed chief product engineer of the organization . . . Prominent Navy aerologist and weather authority Capt. Howard Thomas Orville has retired after 29 years service to become

director of engineering for the Friez Instrument Div., of Bendix Aviation Corp., Baltimore, Md. . . . Greer Hydraulics, Inc., Brooklyn, N. Y., has elected I. W. Burnham, II, and Frederick F. Robinson to its board of directors.

A new firm, Boyle Aviation Co., has been formed by James T. Boyle, president, and Charles Boyle, Jr., vice president. The company, located at 40-66 Lawrence St., Flushing, L. I., N. Y., will distribute and export aircraft engines, parts, and equipment.



50% More Fuel—By providing newly designed integral fuel tanks in the outer wing panels of the Convair Liner, Convair has increased the fuel capacity of the airplane from 1,000 gallons to 1,500 gallons. This has been accomplished with a weight penalty of only 339 pounds. First airplanes to be so equipped will be eight Convairs going to Garuda Indonesian Airlines but Convair officials state that plans are going ahead to offer replacement tanks to airlines for conversion of planes already in service.



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the world for performance and dependability on the job—that includes everything from simple battery-operated range receivers to complete communication systems; in addition, they have made Bendix Radio's manufacturing facilities the largest and finest in the industry. They're busy men at Bendix Radio, and they're working with but one thought in mind—to build constantly better radio equipment for *you*. Keep these men in mind and you will understand why more planes fly more miles with Bendix Radio than any other make.

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Automatic Radio Compasses • Marker Beacon Receivers • Announcing Systems
VHF Communication and Navigation Receivers • Inter-Communication Systems
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Systems • Flightweight Personal Plane Radios • VHF Omni-Directional Range Systems

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CAA Stresses Safety Factors For Civil Jet Transports

CAA has adopted a cautious attitude toward the adoption of turbine-powered aircraft for civil transports. Consistent with CAA's responsibilities to insure safe operations, CAA's views on the jet-powered transport are highlighted by the consideration of devices and procedures aimed at improving the inherent safety of the plane.

This was emphasized in the recent paper before the Institute of the Aeronautical Sciences in Los Angeles in which George Haldeman, chief of the aircraft section of CAA's Office of Aviation Safety, outlined official CAA views to the designers and engineers. As the first official statement on what is to be expected of turbine-powered aircraft in civil use, Haldeman's paper was informative and is sure to attract considerable attention.

As could be expected, speed was a major consideration. Compressibility effects resulting from speed will bring about air loads which are difficult to predict. Consequently, contrary to past policy, CAA will require more wind tunnel test data to determine these loads rather than arriving at them through calculations.

In-Flight Brakes

Even though the structures are beefed up and maximum speed limitations are re-assessed, Haldeman feels that it may be necessary to provide jet aircraft with automatic speed control flaps. These would minimize the possibility that the pilot might inadvertently exceed design cruising speeds. Basically, these flaps would resemble dive brakes but automatic operation would be provided so that they would operate and be fully effective within five seconds of the time the aircraft reached the critical speed.

Flying at high altitudes the aircraft would be subject to instability brought about by sweepback in the wings which reduces lateral dampening. As a result the aircraft develops lateral oscillation or "dutch roll." The CAA official noted that this might be overcome by use of a rate-gyro to measure the condition and associated

electronic and actuating circuits to move the controls and reduce the effect.

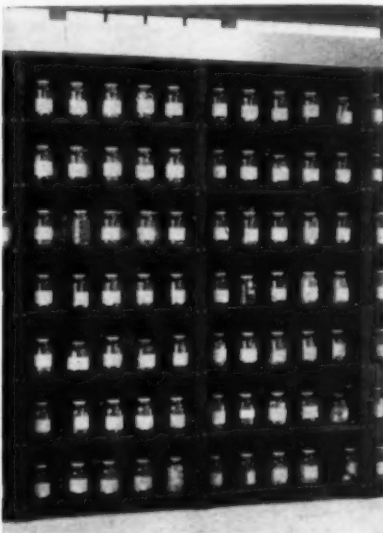
CAA has noted incidents in which doors have opened in flight and is prepared to recommend inward-opening exits. Current CAA regulations requiring outward-opening doors have made it possible for doors to open in flight, even at present low cabin pressurization. Manufacturers have urged that CAA change its regulations and apparently this will be accomplished. This will result in savings in structural weight over what would otherwise be required.

Pressurization Failure

In the event of a pressurization failure Haldeman felt that flooding of the passenger cabin with pure oxygen or the use of individual oxygen masks might be required. Acknowledging the shortcomings of these systems, he



Haldeman



Row on Row— This is a small cross-section of the shelves in the stock room of Linea Aeropostal Venezolana's maintenance base in Caracas. Each of the bottles contain small parts such as bolts and nuts. The system arrangement is part of a perpetual inventory system with minimum and maximum numbers of each unit together with proper identification marked on the white labels. It is cross-indexed to a Kardex system in the maintenance offices.

noted that it may be possible to build the aircraft with adequate structural integrity to rule out pressurization failures and consequently to get along without special provisions.

In the event of a ditching, Haldeman recommended that consideration should be given to complete evacuation of the aircraft within 60 seconds with a maximum time requirement of one second per person. The latter provision has been in regulations for some time but to date there has been no over-all maximum time limit, thus a 100 passenger ship could now meet the requirements if it could be evacuated in 100 seconds.

Because of the higher landing speeds, which Haldeman recommended should be figured on the basis of an approach along a three-degree glide path, more efficient braking systems should be provided and anti-skid devices should be used. This will combat the higher landing speeds, the resultant lift which minimizes brake efficiency and the lower coefficient of friction realized by the system at high speeds. Haldeman made no mention of the parachute decelerating methods now being used so successfully by Boeing but noted that ultimately reverse-thrust systems might be available. He also felt that it may be advisable to have duplicate braking systems.

Temperature and Humidity

For some time aircraft manufacturers have expressed concern over the effect which full temperature accountability might have on payloads for the jet transport. CAA's engineers had bad news for the operators. Not only would full temperature accountability be required at temperatures above freezing, but, at least for the present, no allowance would be made for temperatures below freezing. Also, as previously predicted, CAA will probably also require humidity accountability. Haldeman felt that this might be accomplished by a combination temperature-humidity curve which automatically accounted for both factors.

When a turbojet engine fails the compressors and turbine continue to windmill. Sometimes this causes excessive vibration and even engine fires. CAA will look at installations with multiple power units in one nacelle with a critical eye toward the independence of engines in case of a failure of one engine. To minimize the possibility of windmilling compressors in dead engines, engineers should consider the use of engine inlet or exhaust covers, or possibly the use of integral braking unit, Haldeman indicated.

Military operations in which combustion section and rear chamber

failures have resulted in fire makes it advisable to have vapor- and liquid-proof firewalls, Haldeman said. It "will be necessary that additional design and weight sacrifices" be made to insure against the spread of fires.

Engine Blowouts

Haldeman was also concerned about blowouts, a condition in which the engine combustion stops and relighting is difficult without the loss of considerable altitude. Noting the work now being accomplished to eliminate this problem, Haldeman felt that the problem might be licked before commercial operations are initiated. Particularly important in this field, he said, are improvements in combustion chamber design, variable-area fuel nozzles and improved fuels.

Despite the fact that effective anti-icing systems have yet to be designed, the CAA official noted that four turbo-jet engines have already been approved by CAA for commercial use and at least six other engines are now being readied for certification.

There has been considerable industry controversy over the safety aspects of storing fuel in the fuselage of transport aircraft. Present-day bombers with turbine power have fuel supplies stored in the fuselage. As noted by Haldeman, it may be difficult, if not impossible, to store the fuel in the wing or in a remote position. Haldeman suggested that with proper segregation arranged, it may be acceptable to CAA to have fuel in the fuselage.

Strong Cabin Tanks

This would require that suitable protective structure be used between the tanks and the balance of the fuselage and that the tanks themselves be of rugged construction. The possibility of having tanks capable of withstanding 20-G loads should be investigated, he said. Proper ventilation must also be provided. As a final measure CAA will probably require that commercial jet aircraft use low-volatility fuels, such as kerosene.

While most of the considerations outlined here are of a general nature, Haldeman's paper was spiced with specific performance requirements which should prove of considerable value in guiding aircraft designers. He delved into both design and performance parameters, suggesting changes in the relationships between speeds for maximum gust, cruise and dive speeds, etc.

In some instances it appeared that concern was expressed over matters which have actually been solved and in some instances put in service, yet on the whole Haldeman's paper should prove a valuable guide to CAA's thinking in the design of tomorrow's transport.

Extra Section

By William D. Perreault



THE USAF recently completed drop tests on the improved droppable lifeboats manufactured by Edo Corp. of College Point, N. Y. During the tests, which were conducted in the Gulf of Mexico, the all-aluminum boats were dropped from a B-29 at heights ranging from 700 to 2,500 feet. Fully equipped, the boats weigh about one and one-half tons and are lowered to the water by a Pioneer parachute 100 feet in diameter. The 30-foot boat hits the water about 100 seconds after its release at 2,500 feet. The engine-powered boats have enough fuel for 500 miles and in addition to standard supplies carry dry clothes for 15 people. Another feature is a distilling unit which produces hot fresh water from the sea.

It's a pleasure to report that R. O. Smith, well known in the airline business, has recovered from the attack of polio that hit him several years ago. R. O. has thrown away his canes and his active mind wants to get back into business. He was with National Air Transport 'way back when, then went with Eastern as radio technician for four years until 1934 when he became superintendent of communications for Central Airlines, which became PCA in 1936 and then Capital. He left Capital in 1946 to join Aeronautical Radio, Inc., and became president in 1948 until his prolonged illness. His home address is 1235 North Glebe Road, Arlington, Va.

When John Ray of Eastern Air Lines celebrated his 25th anniversary with the company recently, it was a heart-warming occasion. The 200 employees who gathered for the ceremonies represented a cross-section of everyone in the EAL organization, including Captain Eddie Rickenbacker who was on hand to present Johnny with two miniature duck hawks and an initialed gold ring. While building a reputation as one of the industry's outstanding engine men, enroute to his present job as general superintendent of maintenance for EAL, Ray has been equally successful building lasting friendships. This was amply demonstrated when, during the ceremonies, he was presented with a keg of some 500 silver dollars sent in by employees all over the EAL system. Congratulations, Johnny Ray.



Ray

In recent releases covering FC-10, the rain repellant developed for use on aircraft windshields, the manufacturer stated that the substance is so effective in keeping windshields free of rain that the Avro Jetliner was designed and is operating without windshield wipers, simply using the rain repellant and getting satisfactory results. This would appear to be a remarkable accomplishment, especially in the light of the ease of application of the new compound.

Northwest Airlines has established a new apprenticeship training program for aircraft mechanics. They are to be congratulated. For over 300 years the skilled trades of this country have been kept alive by men who trained as apprentices and through correlated work and training carried on the best traditions of the trade. Those lines who in the past have carried out objective programs of this type reaped tangible benefits. With the increasing trend to specialization, airline maintenance should be a flourishing field for apprenticeships. Apprentices could provide the "all-around mechanic" who must be available for supervisory positions in tomorrow's industry.

NEW PRODUCTS

Resistor Spark Plug

The B G Corp., 136 W. 52nd St., New York 19, N. Y., is marketing a new and improved unshielded, ceramic spark plug with insulated resistor. The plug is known as the BG Model 706R and is in full-scale production. It features a resistor which is said to reduce gap erosion and thus insure longer periods between overhauls. The Model 706R has been approved for use in the Continental A50, A65, A75, C75, and C85 engines. The Model 706 plug without resistor is still available at a slightly lower price.

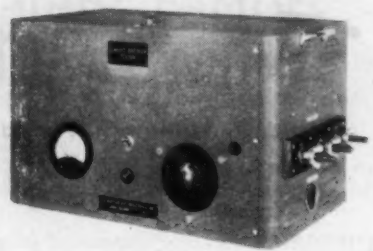


Sound Level Meter

Hermion Hosmer Scott, Inc., 335 Putman Ave., Cambridge 39, Mass., has introduced a pocket-size sound level meter weighing slightly more than two pounds. The new unit, appearing much like a flashlight, covers the range from 34 to 140 decibels above the standard ASA weighting characteristics which duplicate the ear response at various loudness levels. Sub-miniature tubes and hearing-aid batteries permit rugged compact design meeting American Standards Association specifications for sound meters. Optional accessories include a carrying case, extension cable, input adaptor and mounting tripod. Vibration pickups and integrators are available for measurement of displacements, velocities and accelerations in the audio frequency range.

Circuit Breaker Tester

Schaffer Air Industries, 37-15 11th St., Long Island City 1, N. Y., is in production on a new unit for testing circuit breakers installed in aircraft without the necessity for removing the circuit breaker to the shop. The Model 42 Circuit Breaker Tester is completely self-contained, except for a source of 110-volt AC electrical power. It will check the performance of all aircraft circuit breakers up to and including 150-ampere units. For extreme accuracy in testing smaller circuit breakers, separate low-amperage test connections are provided. This unit is provided with



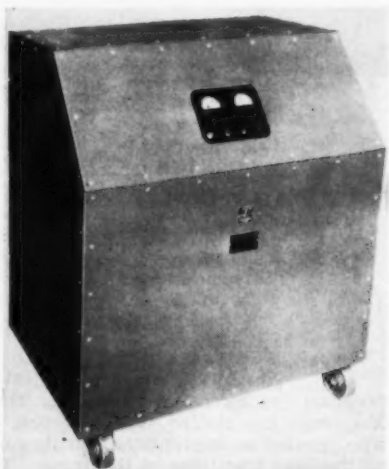
all necessary instruments, controls, and operating instructions, and includes a storage compartment with high- and low-capacity leads and a grounded power cord.

400-Cycle Converter

Brown Instruments Div. Minneapolis-Honeywell Regulator Co., Wayne & Roberts Aves., Philadelphia 44, Pa., has introduced an 8½-ounce 400-cycle converter for use in servo-mechanisms and electronic and electrical apparatus. The unit is composed of a single-pole, double-throw, synchronous switch, actuated by a coil-driven vibrating reed. It converts low-power direct voltage signals as low as one microvolt to 400-cycle alternating voltages. Housed in a suitable dust- and moisture-proof case, over-all dimensions of the converter are 4½ x 3-9/16 inches. Company claims it is particularly useful in applications requiring error voltage measurements or null detection.

DC Power Supply

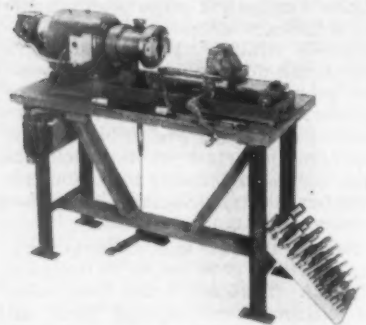
Sorensen and Co., 375 Fairfield Ave., Stamford, Conn., has introduced a 28-volt, 150-ampere regulated DC supply unit. The Sorensen Model-E-28-150 works on 208/115 three-phase input and



puts out 28 volts direct current adjustable in a 10% range. Normal load is 15-150 amperes. Regulation accuracy is .25% against line or load. Ripple maximum is 1% (RMS).

Assembly Machine

Aeroquip Corp., Jackson, Mich., has available a hose assembly machine which will enable large users of Aeroquip hose lines to make up lines on a production line basis up to 600% faster than by hand assembly. The unit will accommodate all types of standard Aeroquip



fittings including male pipe, swivel, flange and elbow types. The hose assembly machine is mounted on a heavy cast iron base, equipped with speed selector, tool steel mandrels, interchangeable jaws and many other features.

Control Rheostat

Barber-Colman Co., Rockford, Ill., has designed a new rheostat which combines control point selection for automatic heater or bypass valves for manual over-ride. The control point for automatic valve operation is set on a grad-



uated dial. In case of automatic control failure, valves of other units can be manually positioned by detent action switches at the ends of the rheostat travel. Precious metal contacts minimize wiper-arm resistance and a vibration-proof friction brake maintains rheostat position. Available in single or tandem arrangements with maximum resistance up to 3,000 ohms. Maximum rheostat travel is 180 degrees.

Correction

In the June 1 issue of AMERICAN AVIATION we carried a New Products item relating to the Varo Mfg. Co.'s phase adapter but illustrated it with a cut of Varo's electronic inverter. Before the error was rectified the June 15 issue appeared with the new electronic inverter item but illustrated with the phase adapter photo.

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AMERICAN AIRLINES *INC.*

Airline Salesman: Intriguing But Untrained

(Editor's Note: In this article, an airline district sales manager gives his views on the airline sales representative, his productivity, and proposed means to increase it. He has criticisms of the salesman, the sales manager, and management. The views are his own and not necessarily those of this magazine. Differing views are invited.)

THE AIRLINE sales representative, or as he is called in some companies, the traffic representative, is one of the most intriguing personalities in today's picture of American salesmanship. With few exceptions these men are of the highest type, well educated, with excellent personalities and representative appearances. However, with all of these seemingly great traits, the sales representative of today generally is not reaching his full stature as a salesman, nor is he bringing to his company the volume of new business it should expect.

The lack of policy, or the hit-or-miss sales policy, of many airlines is every day making potential salesmen lazy or is driving the more ambitious ones right out of the airline industry into fields with better-organized sales plans and more lucrative opportunities. This article would be only of historic interest were it not

for the fact that many of the failures presented are happening today.

Take the young GI just out of the service in 1945. If he were at a ticket counter and knew enough to smile and be courteous to the public, or if he were in reservations and went after round-trip business (remember, we were not doing those things in 1945), he usually stood out like a shining light in a dull picture of order taking. In no time at all the local manager was singing his praises to the general office and soon after appointing him as a full-fledged outside sales representative of the company.

No Career Plan

Here the trouble really started. Instead of being sold on his future as a successful salesman, he was led to believe that in the near future he would become a city or district sales manager. If he had initially been offered a career plan as a salesman and the many incentive successful organizations offer, we are sure that he would not have been quite so anxious to switch from sales to the heartaches of handling personnel cutbacks, union grievances, and wrestling with low load factors.

Our new salesman, after he had purchased his shiny new briefcase, was then "shown the ropes." Usually,

the local manager or an elder salesman took him out on calls for a day or two, and after this short training he was given a territory or a group of old sales cards and told to go to it—and he did. However, he soon found out that he wouldn't be popular if he made 12 calls a day, because the other fellows were getting away with eight. Too few of the managers found time to make joint calls with the salesman on a regular basis, observing his approach, giving him new ammunition and offering him a steady education.

The other fellows from the other lines met every day for coffee and long morning bull sessions. The movies beckoned and the new salesman soon learned many reasons why he shouldn't sell.

Lack of Supervision

Some sales representatives viewed themselves as "court jesters" and we have seen the travel agency representative of one line wearing a tie with flashing lights, which we are sure rolled the secretaries in the aisles, but which made the travel agency owner furious.

There was also the salesman who spent five months visiting his girl friend during office hours, merely turning in daily sales reports to his local manager. The movie habit, the



Ultra-Modernity—This resplendent airline ticket office in Milan, Italy, is not the product of some well known architect of the ultra-modern school, as one might



surmise, but was designed by none other than the president of the airline, Dr. Paulo Sampaio of Rio de Janeiro. The airline is Panair do Brasil, Pan American World Airways affiliate.

Over the Counter

flashing tie, and faked calls (and, of course, faked expense accounts) would not have happened had the salesman been properly supervised and guided and offered the incentives to make more calls and sell more airline seats.

Many industries today are faced with the sad situation of saying goodbye to the salesman who built American enterprise. Remember him? He was the salesman who worked on a straight commission and prospered at it. Today's salesman is a salaried man. His main incentive to sell—more money—is gone, with the result that he now spends more time preparing glowing sales reports to please his general office and less time in a prospect's office asking him to buy. How little we know of the success or failures of his efforts.

The writer is not suggesting that airline sales representatives go on straight commissions because obviously this system would not work. But he does feel that a portion of the individual sales representative's income should come from a commission or bonus plan. Capital Airlines has taken a fine basic step by paying commissions to its men for selling charters and international business. We are sure that its men are spending less time calling on the account who never travels but who is a good fellow, or on the one-trip-a-year traveler, and more time researching and developing heavy volume business.

Sales Quotas

The individual commission plan could be expanded in many ways to the monetary benefit of the salesman and the company. Take the travel agent market, air travel plan holders, interline, or hotel transportation desks. It should be fairly simple to establish base quotas of sales expected in the coming quarters or in the coming year, based on previous years' volume.

For example, a salesman calls on agents and in the past year the average volume from his agents was \$100,000. This could be the base figure. Adjustments could be made for new agencies, additional flight schedules and new routes. The salesman would then know what was expected of him on the basis of his current salary. Now for the incentive: for the volume over his base quota the salesman would be offered either a bonus or a practical commission.

Each year's base quota would be restudied and adjusted, the salesman's salary would be reviewed on the basis of results, and new incentives for the next year would be offered. The company would be sure its men were now by-passing the deadwood and getting into fertile new fields, and

Sales Offices

UNITED Air Lines has transferred its eastern regional sales office from Chicago to New York "in recognition of the growing importance of the eastern seaboard to United's . . . system." The office, under direction of **M. P. Bickley**, is located at 80 E. 42nd St., and directs the sales activities in 40 UAL cities from Colorado to the Atlantic . . . **TWA** will open a new street-level Fifth Avenue ticket office in early August at the corner of 50th St. and Fifth Ave., New York, in the International Building. The company will continue to operate the present ticket office on the mezzanine of the International Building . . . **British Overseas Airways Corp.** is completing a new sales and ticket office at 342 Madison Ave., New York, and will move there in a few weeks. **BOAC** has also moved its New York downtown departure terminal to new quarters in the Waldorf-Astoria Hotel, at 111 E. 49th St.

Sales Promotion

Continental Air Lines' manager of interline and agency sales, **Tom Dempsey**, has sent an eye-catching letter to other airlines. Attached to it is a gold nugget, assayed at \$40 a ton. "Routing your passengers along Continental's system . . . will enable your airline to find a pot of gold at the end of the rainbow in the form of additional revenue," says Tom's letter. We'll bet people keep their nuggets—and remember Continental.

Railway Express Agency has printed a four-page folder, on the front of which are 30 airline symbols from which have been removed the names of the airlines. The trick is to see how many you can guess. Answers are on the inside, together with the punch line: "These are the airlines you tried to guess—and all of them carry air express." A good direct-mail piece . . . **United Air Lines** is distributing on Honolulu-bound flights a booklet "Hawaiian for the Malihini," containing Hawaiian words, phrases, place names and rules for pronunciation . . . **TWA** has issued an elaborate folder promoting "Skyliner Tours of the West."

Passenger Service

"A nice air traveler" is the title of a memorandum sent to all **Continental** ticket offices and station managers by **L. H. Dennis**, director of flight service. Written in the first person, it explains that the writer is a nice fellow who never complains if the telephone service is slow, if he's mishandled at the ticket counter, kicked around by the flight attendant, etc. "No, I'm the 'nice' air traveler. And I'll tell you what else I am. I'm the air traveler who never comes back! That's my revenge for getting pushed around too much . . . It's far more deadly revenge than blowing my top would be. In fact, a 'nice' air traveler like myself, multiplied by others of my kind, can just about ruin any transportation company. I laugh when I see you frantically spending your money on expensive advertising to get me back when you could have had me in the first place for a few kind words, a smile and a little service." Heading on Dennis' memo is: "How much money are we losing?" A pretty powerful argument for good passenger service.

Pioneer Air Lines is now giving each baby traveling on its airplanes a pair of shoes, through arrangements with the **Curtis Shoe Co.**, Temple, Tex. The program will continue through the remainder of the year. Says Pioneer: "If baby needs a new pair of shoes, fly Pioneer."

Both **United Air Lines** and **American Airlines** are mailing **Hertz Driv-Ur-Self** courtesy cards to the holders of their air travel cards. The move will eliminate red tape and deposits in connection with car rentals . . . **Continental Air Lines** has replaced hostesses with male flight service agents on four of its local flights. Change was necessary, company said, because of increase in cargo loads to be handled and shorter stops on the flights.

New Services, Traffic and Tariffs

Linee Aeree Italiane, Italian airline in which **TWA** has a 40% interest, opened scheduled service between Rome and New York last month. For the time being, service is once-weekly with DC-6's . . . **Pan American World Airways** had added three round-trip Constellation flights weekly New York-San Juan . . . **Scandinavian Airlines System** has added a fourth direct flight New York-Hamburg . . . **Transportes Aereos Nacionales** was to begin regular operations between Miami and Tegucigalpa, Honduras, last month . . . **Robinson Airlines** will inaugurate service to Utica and Rome, New York, through Oneida County Airport on Aug. 15 . . . **Pan American-Grace Airways** has cut berth charges on its DC-6 El Interamericano Miami-Buenos Aires service. New rates are \$20 for a lower and \$10 for an upper, compared with a former \$45.

National Airlines has filed a tariff with CAB for a daylight DC-6 New York-Miami air coach operation at \$53 one-way, effective Aug. 5. This would be in addition to the DC-4 night service at \$47.40 . . . **Hawaiian Airlines** has been authorized by CAB to inaugurate the half-fare family plan at the earliest possible date . . . **American Airlines** and **Canadian Pacific Railway** have signed a passenger sales agency agreement under which CPR offices in Canada, Europe and New Zealand become recognized agents for AA and AOA.

—ERIC BRAMLEY

TRAFFIC & SALES

the salesman would know that with those extra calls and harder work would come more money in the bank.

Men Know Market

Many sales representatives complain that their only contact with management comes during sales meetings, when all they usually get is a heavy pep talk. These fellows know the airline market because they are out "feeling" it every day. Wouldn't it be wise for management to invite their counsel when preparing new schedules or new service plans? Their advice might well forestall an unsaleable flight and develop in its place a high load factor trip based on their experience in the market. Bringing them closer to the problem of sales management would mean understanding by them of reasons why certain things could not be undertaken, and it would better prepare the salesman for the day when he might become a manager.

This article was written because some airlines today do not feel that their salesmen are producing enough

to justify their existence, and in some cases they are not. We believe that if the airline salesman, who is the best potential money-maker we have, is given the tools to work with and the monetary incentive, his productivity will increase greatly.

And to the sales representative: if you think those eight calls a day are enough, try this little test. Each time you walk into an account's office and face the prospect, check your watch and when you leave check it again and note how many minutes you were selling. At the end of the day, add all of the minutes up and discover your "productive selling time record" for the day. Two hours—not so good. Three hours—you're getting warm. Four hours—you, mister, are on the right track to new business and personal success.

CAB CALENDAR

Aug. 7—(Docket 4405) Hearing on proposed acquisition of West Coast Airlines by Southwest Airways. 10 a. m., South Lounge, Carlton Hotel, Washington, D. C. Examiner James M. Verner.

Aug. 7—(Docket 4161) Hearing resumed in

Trans American Airways et al. Enforcement Proceeding. Los Angeles.

Aug. 7—(Docket 4228 et al.) Hearing in Philadelphia Service Suspension Case (International Routes). Tentative. Examiner Herbert K. Bryan.

Aug. 14—(Docket 3718 et al.) Hearing in reopened Southwest Airways Certificate Renewal—United Air Lines Suspension Case. 10 a. m., South Lounge, Carlton Hotel, Washington, D. C. Examiner Paul N. Pfeiffer. Postponed from July 24.

Aug. 16—(Docket 3966 et al.) Hearing in reopened West Coast Airlines Certificate Renewal—United Air Lines Suspension Case. 10 a. m., South Lounge, Carlton Hotel, Washington, D. C. Examiner J. Earl Cox. Postponed from July 26.

Aug. 18—(Docket 2019 et al.) Hearing in reopened Additional California-Nevada Service Case. Tentative. If held in Washington, August 18 date will be observed. If held on west coast, hearing will be August 21. Examiner F. Merritt Ruhlen.

Sept. 11—(Docket 4207) Hearing in Arrow Airways-California Arrow Interlocking Relationships Case (Enforcement Proceeding.) Tentative. Examiner Walter W. Bryan.

Sept. 11—(Dockets 3213 and 4187) Hearing on applications for Havana-New York Foreign Air Carrier Permits. Tentative. Examiner J. Earl Cox.

Sept. 18—(Docket 4228 et al.) Hearing in Philadelphia Suspension Case, American Airlines et al. Tentative.

combustion engineering—in action—for air progress



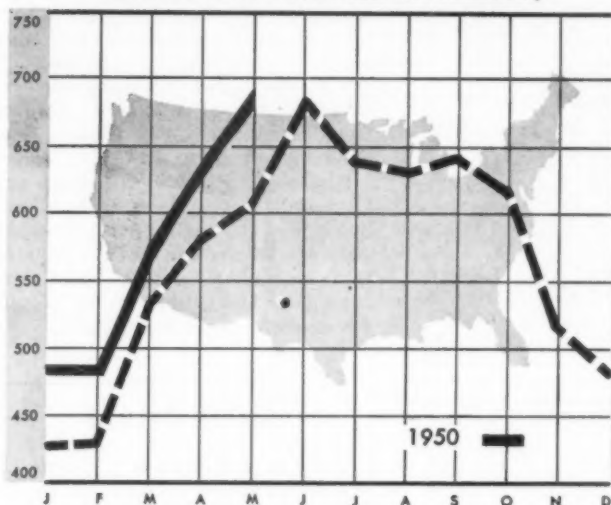
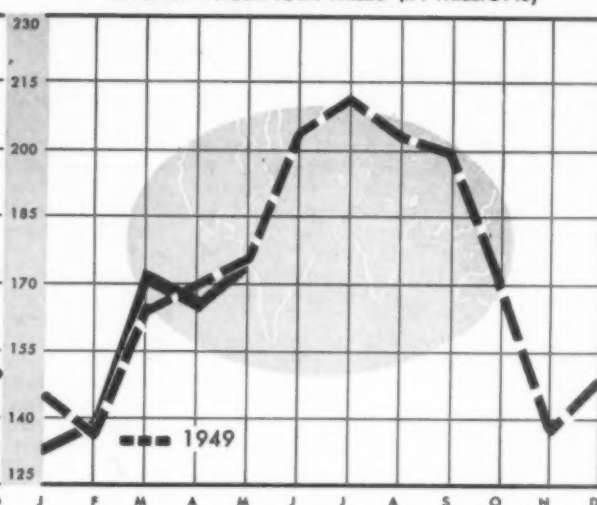
squeezed air

... to shrink a heater

Here's hot news on the vital problem of anti-icing the new knife-sharp jet wings: a brand new heater that packs more heat into less space than ever before—by using "squeezed air"! A small percentage of air is bled from the jet engine compressor, fed to a pint size heater that boosts final air temperature way up to 650° at 90 psia. Superheated air can then be piped in small tubing to the heat distribution system. This job is one of many Janitrol developments that hold great promise for aircraft of the future.

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DOMESTIC TRUNK AND FEEDER COMBINED
REVENUE PASSENGER MILES (IN MILLIONS)INTERNATIONAL
REVENUE PASSENGER MILES (IN MILLIONS)

Still Climbing—Passenger traffic volume of the U. S. certificated airlines continued to show a rise through May as compared with last year. Graphs above show that the domestic trunk and feeder lines combined flew 693,302,000 revenue passenger miles in May as against 645,770,000 in April, while the U. S. flag international carriers flew 174,514,000 passenger miles in May as compared with 169,323,000 in April.

Airlines Reach Wide Field Through Education Activities

By ERIC BRAMLEY

A LITTLE-PUBLICIZED but highly important job is being done by some of the major airlines in furnishing aviation material and information to teachers and students in schools throughout the U. S., and it is being done on a scale not generally realized even in the industry itself.

The job, although it involves a considerable outlay of money for materials and personnel, is for the most part non-commercial. An airline will, of course, carry its name in any literature or films distributed, but the primary purpose is not to advertise itself. It's a sales job for aviation. Students familiar with air transportation become natural sales channels to their parents and friends, and also become future passengers themselves.

As an example of what is being done to spread the word about aviation, Dr. John H. Furbay, director of TWA's air world education office which was set up in 1945, points out that his office in 1949 filled 7,646 requests for educational packets and other materials to teachers and students. This is an average of 637 per month. In a recent week, before the

close of schools this spring, TWA received 549 requests from teachers.

Reaches Wide Audience

Dr. Furbay last year personally gave 182 lectures to an estimated total audience of 199,195. Add to this other TWA speakers, plus cooperative lectures and film presentations, and the airline estimates that it reached 656,095 persons last year, not including several radio and television broadcasts.

In addition to regular packets sent to teachers, TWA answered about 15 requests monthly from students wanting technical information for theses, information about aviation employment, careers, etc. The packets, incidentally, are designed for both elementary and secondary school students.

Films are constantly playing a larger and larger part in the educational field. In 1949, 221,000 persons saw TWA's educational short, "Magic of Ireland," and the film is placed in 40 visual aids libraries along the system. One hundred prints of "Spain: The Land and the People" have been distributed to libraries on the line for circulation in schools and clubs. Nu-

merous other films have also been made available.

Overseas Tours

Overseas tours have been pushed by TWA, and the company expects to fly more than 1,000 students and teachers abroad this summer and fall. One tour, for example, will include a summer course at the University of Geneva, for university credit. In all, there will be eight tours.

Other examples of the 1949 work of Dr. Furbay's office: 96 aviation education summer workshops were set up in the U. S. in cooperation with CAA; Dr. Furbay spoke at 26 large state and national teachers' meetings during the fall; exhibit booths for aviation education materials were set up at 11 state teachers' conventions, attended by over 100,000 teachers and administrators; assistance was given in arranging admission for Indian students in American universities; plans for an aviation essay contest were set up.

Pan American World Airways has been active in the educational field since 1944. In that year, the company received some 1,600 inquiries—letters from teachers, librarians and students. By 1949, requests for information had jumped to 20,500. Even these figures are not a true index of the volume of activity, according to George Gardner, PAA educational director, because during the past three years the company has used a request blank which was distributed at meet-

TRAFFIC & SALES

ings and mailed to teachers writing to PAA. The company responded to 50,000 requests submitted on this form.

Magazine for Teachers

PAA also has a publication, *World Airways Teacher*, issued every two months during the school term as a service to teachers. Circulation is about 40,000 per issue. One recent issue, for example, featured an article on "An Air View of Peru Today," while another was titled "Italy in Holy Year." PAA is sometimes mentioned in the copy, but is not over-emphasized.

In cooperation with the Institute of International Education, PAA also sponsors 50 travel fellowships each year, and has done so since 1937. Provided suitable candidates present themselves, the fellowships are distributed so that at least one student from each Latin American country is assisted each year in round-trip transportation from his home country to the terminal of PAA nearest his place of study in the U. S.

The awards to U. S. citizens are made on the basis of approved study or research projects in Latin America, the nature of the study determining the place of study and destination of the traveler, and also provide free round-trip transportation between the nearest PAA terminal and the country where the study or research is to be undertaken.

Sponsors Model Event

PAA has been very active in the model airplane field. During 1950 it

will sponsor the PAA Load Event in about a dozen top-flight meets throughout the U. S. and will distribute substantial cash prizes to the winners.

American Airlines has done extensive educational work over the past several years. At the present time, the company does not handle such projects through one department, but requests for specific information are channeled to the department concerned. Speakers are also furnished on this basis.

United Air Lines' school and college service, established in 1940, had its biggest year in 1949, and R. O. Mertes, director, expresses the opinion that "much progress was made towards the development and recognition of national programs in aviation education." Requests from educators for materials totaled upward of 400 per day during the peak periods of October, November and February.

UAL's distribution of educational literature last year exceeded 1,000,000 copies, and slidefilm audiences were conservatively estimated at well over 1,500,000. This latter takes into account that over 68,000 prints of UAL's eight slidefilm subjects have been placed in U. S. schools on a permanent basis, free of charge.

The company's school and college staff participated in 113 speaking engagements of major importance and 50 national conventions. Tours were conducted through UAL installations and over 20,000 people visited facilities in Chicago, Los Angeles, San Francisco and Seattle.

In addition to slidefilms, UAL will

also furnish motion pictures on a free loan basis, and pictures and other materials for bulletin boards. It will send teachers elementary and high school bibliographies, a booklet on "How Representative Grade Teachers Are Teaching Aviation," timetables, menu cards, vacation folders, and other material.

It adds up to the fact that the airlines are doing a large-scale educational job, reaching millions of people. They're contributing towards making U. S. students air-minded and travel-conscious, and future users of and salesmen for air transportation.

CAB Briefs

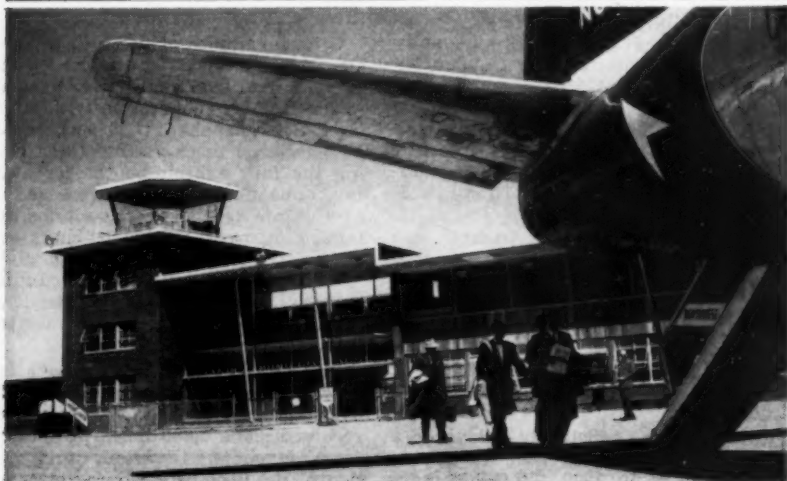
CAB Examiner Edward T. Stodola has recommended Board approval of the acquisition by **Hughes Tool Co.** of "complete actual and legal control" of **Trans World Airlines, Inc.** The transactions recommended for approval were dated Jan. 8, 1947, and increased the Hughes stock interest in TWA from 45% to 73%.

Requests of **Braniff Airways** and **Eastern Air Lines** for dismissal of certain portions of the National Airlines Dismemberment Case relating to stock acquisitions in **National** by **Pan American** and **Panagra** were partially denied by the Board. Portions which sought dismissal of proposed interchange agreements of NAL, PAA and Panagra were set aside for 30 days "pending the outcome of current negotiations between the parties."

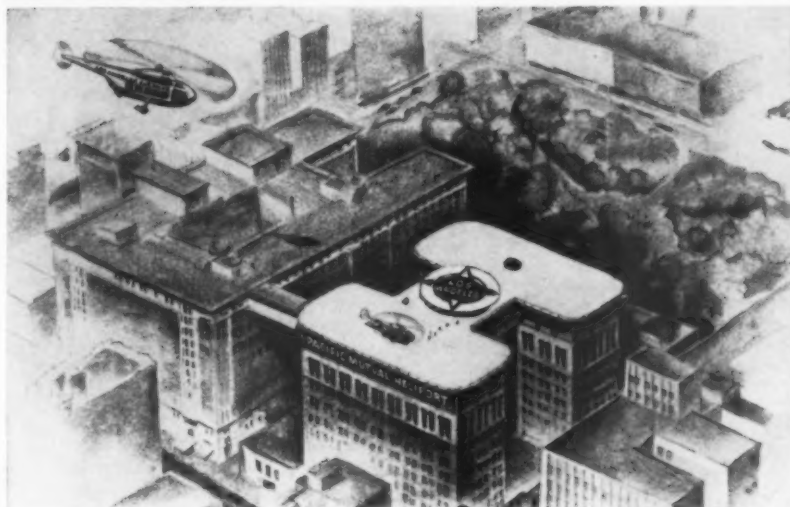
CAB has denied an application of **Resort Airlines** for an exemption authorizing it to engage in air transportation of persons and property between Southern Pines-Pinehurst and its certificated co-terminal points of Miami, New York, Philadelphia and Washington on a seasonal basis.

Examiner R. Vernon Radcliffe has recommended denial of all applications in the Michigan-Wisconsin Service Case on the ground that an adequate connecting service between **Wisconsin Central** and **Capital Airlines** at Milwaukee could provide all air service required between the upper and lower peninsulas of Michigan.

The Board has tightened its regulations covering irregular carriers using twin-engined aircraft on flights between the U. S. mainland and San Juan, Puerto Rico, to require: (1) that such flights follow the island chain route; (2) that no non-stop flights be scheduled out of San Juan for points north of Jacksonville; (3) that Puerto Rico-U. S. flights carry fuel supplies calculated on the basis of CAR 42:52 (b); and (4) that planes on such flights carry a crew of one radio operator, one navigator and the usual pilot and co-pilot unless the carrier can demonstrate that it can operate safely with a smaller component.



Modernistic Terminal—This \$300,000 brick terminal building at Yakima (Wash.) Municipal Airport is regarded as one of the finest for its size in the country. Of modernistic construction, the two-storied terminal features a luxurious waiting room with view windows extending from floor to ceiling, and a large second-floor restaurant overlooking the field. The interior of the building is finished in blonde wood paneling. In the above photo, Northwest Airlines passengers board a Martin 2-0-2 from the terminal.



LA's 'Transportation Row' To Get Rooftop Heliport

When it finally gets a helicopter that is suitable for passenger operations, and when the Civil Aeronautics Board grants it a passenger authorization, Los Angeles Airways will be all ready with a top-notch heliport smack in the heart of Los Angeles.

This was assured when the Pacific Mutual Life Insurance Co. announced it would build such a heliport atop its 12-story office building located on the city's "Transportation Row," and would lease the heliport, together with supplementary facilities, to the 'copter operator.

The supplementary facilities will include a luxurious passenger lounge on the 12th floor of the office building. The lounge will be connected with the street by express elevators and with the rooftop landing area by escalators.

To be known as the Pacific Mutual Downtown Heliport, the helicopter landing facility's opening is planned to coincide with delivery of passenger-type helicopters to LAA. The latter is seriously considering the Sikorsky S-55, commercial version of the military H-19, but also is weighing the comparative merits of Piasecki, McDonnell and Bell models.

One-Year Delivery

It is understood that at least one of the helicopter manufacturers can begin deliveries of a commercial passenger helicopter within a year after receiving a firm order.

The Pacific Mutual heliport is the first in what will eventually be a web of passenger heliports encompassing all of southern California within a radius of 180 miles of downtown Los Angeles. Ultimate plans

will bring the heart of Los Angeles within easy commuting distance of all suburban areas and points as far distant as Palmdale, San Bernardino and Santa Ana.

Pasadena, already making plans for a helicopter terminal, will be five minutes from the new downtown port. The express runs to Los Angeles International Airport and Lockheed Air Terminal from the rooftop heliport will take about six minutes.

Maintaining offices in the Pacific Mutual building are American Airlines, United Air Lines and other transportation companies, while within a block are the offices of Philippine Air Lines, Trans World Airlines, Western Air Lines, Pan American World Airways and Cook's Travel Service, to name but a few.

In all, some 50 major transportation services have offices in the immediate area. Also directly adjacent are the Biltmore, Mayflower and Savoy hotels.

Five Airlines Among Top 100 Newspaper Advertisers

Five U. S. airlines were among the top 100 national newspaper advertisers in 1949, while no railroads were represented in this category, according to national advertising computations made by Media Records Inc. for the Bureau of Advertising, American Newspaper Publishers Association.

Airlines led all other forms of transportation in newspaper advertising during the year. Of a total of \$20,048,000 spent on transportation ads, airlines, including six foreign carriers and one non-sked, accounted for \$7,685,000, followed by railroads, \$5,331,000; bus lines, \$2,062,000; steam-

ships, \$1,837,000; tours, \$1,323,000, and miscellaneous, \$1,810,000.

The airlines among the top 100 newspaper advertisers were: Eastern Air Lines, in 57th place with \$1,062,119; American, 72nd with \$855,896; Pan American, 86th with \$674,301; TWA, 87th with \$671,964, and Northwest, 89th with \$655,615. Only other form of transportation represented in the top 100 was Greyhound Corp., 50th with \$1,139,365.

The Bureau's data came from newspapers rather than advertisers. It measured all national ads carried by 984 weekday English language papers in 727 communities with circulation representing 94.1% of total U. S. weekday circulation, and by 365 Sunday papers in 315 cities representing 96.3% of Sunday circulation.

Ads in papers published in towns of less than 10,000 were not measured, and only advertisers whose space cost more than \$25,000 for the year were included. Linage counts were converted into dollar data by applying the one-time rate to space used. The Bureau said that although its computations are not "faultless" they are on the conservative side.

On this basis, airlines are listed as follows:

Airline	Amount
Eastern	\$1,062,119
American	855,896
Pan American	674,301
TWA	671,964
Northwest	655,615
United	588,254
Capital	514,619
National	363,657
Delta	271,395
Chicago and Southern	203,218
BOAC	200,193
Braniff	137,015
Mid-Continent	108,299
KLM	106,353
Western	104,827
Trans-Canada	101,961
Colonial	77,065
Continental	74,533
Air America	72,997
Air France	58,565
All American	56,261
Pioneer	55,517
American and Delta	48,941
SAS	45,631
Northeast	44,924
Trans-Texas	42,101
Piedmont	30,156
SABENA	25,010
TOTAL	\$7,251,387

The above total does not coincide with the \$7,685,000 listed for airlines as against other forms of transportation, because a projection was used in reaching this figure to take into account weekday and Sunday papers not actually studied.



The FLAGSHIP FLEET relies

Today American Airlines has the largest and most modern fleet of transport aircraft in the world. Night and day, week in and week out, one of these Flagships—either a DC-6 or a Convair—takes off or lands every 60 seconds. • The powerful engines of every single one of these Flagships are lubricated with Sinclair Aircraft Oil. For hundreds of millions of miles through the air over the past fifteen years American Airlines has entrusted this vital job of lubrication to Sinclair.

SINCLAIR Refining Company

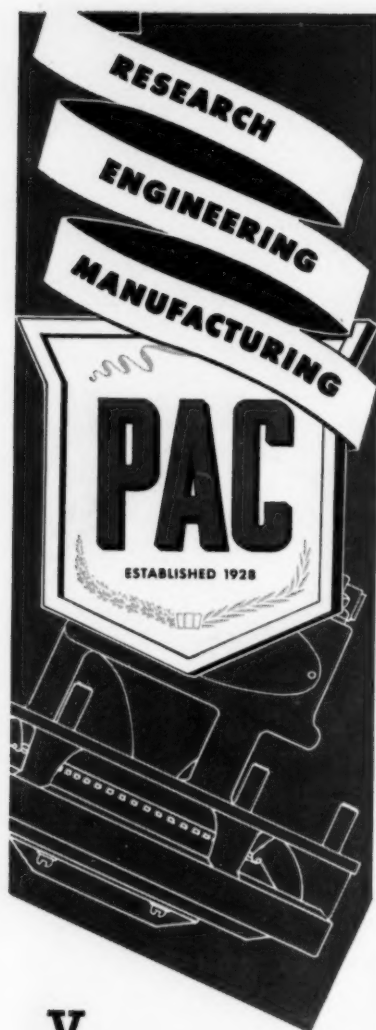


exclusively on **SINCLAIR Aircraft Oil**

SINCLAIR AIRCRAFT OIL — Symbol of dependable maintenance

Without interruption for fifteen years Sinclair has aided American Airlines in maintaining exacting schedules, rigid operational standards, and dependable service. American, in that time, has flown more than 550 million miles with no other engine lubricant than famous Sinclair AIRCRAFT OIL. • For safe, dependable aircraft engine lubrication with less frequent overhaul . . . it's Sinclair AIRCRAFT OIL.

Aviation Sales, 630 Fifth Avenue, New York City



Your blue print for operation efficiency should be on our drawing tables now. If not, let's discuss your problem at the earliest moment. PAC research, engineering and manufacturing has met the challenge of aviation for 20 years. Call or write our manufacturing division... Now!



Airline Commentary

By Eric Bramley



ATENTION passenger service directors: In the July 1 issue, **Wayne Parrish**, our editor and publisher, wrote on his *En Route* page about a Chicago-Decatur trip that he made on the Wabash Railroad's Blue Bird. In commenting favorably on the service he noted that "the coffee didn't lurch out over the table..." Recently he received a note from **Leo E. Clarahan**, Wabash's vice president-traffic, who remarked: "The non-spilling coffee you mention interested me personally because several years ago I found on another railroad a non-spilling type cup which we adopted." This in turn interests us, because we don't recall ever seeing anything on an airplane that resembled a non-spilling cup. We'd like to know (1) why don't the airlines try the cup, and (2) if someone is trying it, why don't they tell us about it?

Barry Daines, Northwest Airlines' station manager in Washington, received a sad, sad phone call recently. The gentleman on the wire said he was with the government and had been assigned to a post in Korea just before the present unpleasantness there. So out he went and bought himself several hundred dollars worth of clothing, mostly new suits. He had shipped them on ahead via Northwest, and he wondered if it were possible to find out what happened to them. Barry went to work and after considerable checking he ascertained that the shipment arrived in Seoul the very day that NWA pulled out ahead of the Communists. So the suits are gone, and some Northern Korean is undoubtedly a very well-dressed man.

Ray Kelly, United Air Lines' superintendent of technical development, tells this story to illustrate why passenger delays, not weather, mechanicals, etc., represent the biggest single category in delayed departures (20% on UAL): A trip was about to leave Denver and UAL was busily paging four missing passengers. Finally, three women strolled leisurely from the terminal toward the gate, and when an agent suggested that the plane was about to leave one of them remarked casually, "Oh, it'll wait for us." They came to life abruptly when the agent at the plane closed the door and started to roll away the steps, but they still got aboard when they screamed loud enough to persuade him to put the ramp back in place. However, UAL was still paging the fourth passenger, "Mister Smith," when the plane rolled away. Suddenly a 12-year-old boy appeared, yelling, "That's my plane." One look at him explained the trouble—he had an arm full of comic books and had been so immersed in them that he didn't realize he was "Mister Smith." We don't know what you do about a 12-year-old, but we've talked with traffic and sales people about the "Oh, it'll wait for us" class and they admit that to a large extent they've brought it on themselves by always being too lenient. We think—and hope—that they're working toward correcting this situation.

Many cities have their "airline rows"—sections where the airline ticket offices are located. It's now interesting to note that Washington is losing its "row" which was in the vicinity of 15th and H Sts. First, American moved its office, and later the United-Eastern establishment across the street discontinued operations. Next will be TWA and Northwest, who are going into a joint office with Colonial and Braniff. So airline row will be completely wiped out. A trend, maybe?

We like the story in *United Air Lines News* that Capt. J. N. Going tells on Capt. C. T. Chapman. Seems that Capt. Chapman came back through the cabin and stopped to speak to a nice, elderly lady. She remarked how much she was enjoying the trip and how comfortable the cabin temperature was. Capt. Chapman agreed and pointed out that it was 70 degrees in the cabin while it was only 37 outside. The nice old lady, giving him a really startled look, wanted to know what he was "doing outside the plane." To which Capt. Going adds: "So do we!"

AMERICAN AVIATION

AIRLINE PEOPLE

ADMINISTRATIVE

A. D. Piepgras, for the past four years comptroller of Northwest Airlines' Orient Region, has been elected assistant treasurer of the company. He joined NWA in 1939 as a clerk and in 1942 was made chief accountant.

Lyman K. Hoffine has resigned as assistant to the system director of industrial relations for Trans World Airlines to open a business of his own in New Orleans. He had been with TWA eight years.

OPERATIONS-MAINTENANCE

Colin H. McIntosh, director of operations for All American Airways since late 1948, has been elected vice president-operations. In aviation for 17 years, he is a past president of the Institute of Navigation and was elected recently to the executive committee of the Air Transport Association's Operations Conference.



McIntosh

J. F. Miller has been appointed district operations manager for Capital Airlines at Chicago. He formerly held the same position at the Wheeling, W. Va., station.

Charles T. Wrightson, manager of ground service for United Air Lines at Fresno, Calif., was presented with a silver coffee service in connection with the presentation of his pin for 25 years of service with the company. He began his career with Varney Airlines, an immediate predecessor of UAL, in 1925.

Capt. William J. Fry, for the past 16 years a pilot with Chicago and Southern Air Lines, has been appointed supervisor of the company's Constellation project, in which capacity he will co-ordinate the training, operations and maintenance programs of the fleet of five Constellations soon to be delivered to C&S.

TRAFFIC & SALES

Prescott A. Tolman, former general sales manager for Eastern Air Lines, has entered business for himself in New York, formulating incentive plans for use in industrial sales promotion programs.

R. L. Dudley, district sales manager for Northwest Airlines in Madison for the past two years, has been named district sales manager in Manila. **J. F. Madison**, formerly sales representative in Milwaukee, takes over the Madison post.

Dennis R. Kelley, formerly on Northwest Airlines' sales staffs in Fargo and

Aberden, has been named sales representative for the airline in Okinawa. He replaces **Jack Riley**, who has been transferred to Tokyo.

John D. Goode has been named assistant manager of advertising media for Trans World Airlines. He formerly was with the J. H. Mathes and the Grey advertising agencies in New York.

Donald L. Langland has been named district traffic manager for Chicago and Southern Air Lines in Chicago, replacing **W. J. Jensen**, resigned. Langland formerly was city traffic manager in Little Rock.

David Delaney has been promoted from eastern district traffic manager for Air France in New York to sales promotion manager of the North American and Caribbean Division of the airline.

Willard P. Farnum, former regional agency and interline manager for Western Air Lines in Los Angeles, has been appointed as western regional manager of Sales Unlimited, Inc., and Geni of Hollywood, Inc.

Chas Wason, northern region manager of traffic and sales for Mid-Continent Airlines since 1946, has been promoted to the newly created post of general sales manager. **William H. Glenn**, superintendent of sales development since 1948, has been named assistant general sales manager. Both have been with MCA 11 years.



Wason

W. H. Humbert has been appointed to the newly-created post of area sales manager for Trans World Airlines for the Allentown-Bethlehem-Easton communities.

Clifford Unbekant, formerly with American Airlines' sales department, has been appointed to the post of convention manager in Colonial Airlines' sales department.

Duncan H. Taylor, formerly assistant district sales manager for Northwest Airlines at Winnipeg, has been named city sales manager at Edmonton, which was recently added to NWA's system. He's a native of Canada.

Bill McDonald, former counter sales agent for Continental Air Lines at Oklahoma City, has been promoted to city traffic manager at Wichita Falls, replacing **Ellis Furda**, who was promoted to district traffic manager in Wichita. **Robert K. Simonson** left the Wichita post to become manager of reservations in Denver.



100%

Efficient flight performance requires 100% completion of every detail assignment. That is true also of profitable airline operation.

There is no room for error—no leeway for looseness—no space for slipshod methods. The same holds true for procurement.

Our assignment is to supply Pratt & Whitney and Wright engine parts, overhaul tools—in fact, all kinds of aeronautical equipment. We are a part of the airline picture.

We, too, must deliver 100%.



**AIRCRAFT ENGINE
AND PARTS
CORPORATION**

345 Madison Ave., New York 17, N. Y.

Graham, Pa.

Ring Bldg., Washington, D. C.

Cable Address: Airparts, New York
U. S. Export Registration No. 2422

News in Brief

(Continued from Page 6)

political science professor at Davidson College, N. C.; Paul Aiken, former Assistant Postmaster General, and John L. Sullivan, former Secretary of the Navy.

Republic F-84E Ungrounded: Republic F-84E's, grounded during the early days of Korean fighting, are going back into service following a 7-point modification program on the Allison J-35-17 engines. Chief trouble, Allison reported, had been inadequate lubrication leading to engine bearing failure.

Brazilian Line Bought: Reports from Brazil say that Olava Fontoura, president of VASP airlines, which is owned by the State of Sao Paulo, has purchased Aerovias Brasil for about \$2.5 million but will continue to head up VASP. Aerovias Brasil was formed out of the original TACA company of Brazil and was bought by the State of Sao Paulo early in 1949 for about \$1.5 million and was to be amalgamated with VASP. Aerovias Brasil operates to Miami. Fontoura is a close personal friend of Adhemar de Barros, Governor of Sao Paulo.

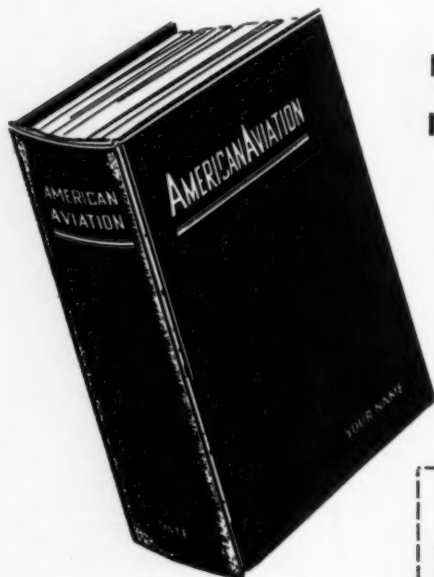
Low-Cost Insurance: A new low-cost accident insurance policy is now available exclusively to members of the Air Force Association with the exception of paratroopers or airborne infantrymen. Military and civilian activities in the air or on the ground, including

flying or flying in military, National Guard, Reserve, CAP and civilian aircraft, are covered in the policy which is issued by Lloyd's of London through J. Blaise de Sibour & Co., Washington, D. C. Premiums range from \$3.00 per \$1,000 protection to \$15.00 per \$1,000, depending on the status of the individual. Those in regular military service pay the higher rate. The policy is available in units of \$1,000 up to \$10,000 maximum. Actual military operations against an enemy are, of course, excluded.

Not for Sale: All scheduled airlines that had placed DC-3's on the market have withdrawn the equipment from sale pending clarification of military requirements. If Air Force requires more transports, airlines may need DC-3's.

Labor Dispute: Threatened work stoppage by about 1,100 clerical and passenger service employees of Braniff Airways, due to breakdown of negotiations over basic wage contract, has resulted in decision by President Truman to appoint emergency board to make recommendations. Involved is the Brotherhood of Railway & Steamship Clerks, Freight Handlers, Express and Station Employees which was certified as bargaining unit for the group in 1948.

Central Buys Three C-47's: Central Airlines has purchased three C-47's in Miami and will use them on its feeder system if CAB approves the switch to multi-engined equipment. Prices ranged from \$24,000 to \$27,000 per plane.



KEEP YOUR COPIES OF **American Aviation** IN THIS HANDSOME, DELUXE BINDER!

Every issue snaps into place in this beautiful maroon fabrikoid binder with the title **AMERICAN AVIATION** stamped in genuine gold leaf as shown. This distinctive cover holds 24 issues of **AMERICAN AVIATION**. Remove any issue you desire and re-insert it just as easily—no cutting or punching necessary. The binder always opens flat just like a book, strong enough to last for years.

Fill in the COUPON below. Mail it with your check to: **AMERICAN AVIATION**, 1025 Vermont Avenue, N. W., Washington, D. C.

USE THIS HANDY ORDER FORM

AMERICAN AVIATION
1025 VERMONT AVE., N.W.
WASHINGTON, D. C.

Send me of your Binders for **AMERICAN AVIATION**
for which I enclose (check, P. O. Money Order) for \$.....

Name

Street and No.

City and State

personalize

Stamp my name in gold for 50c extra ☐ Year only, 30c ☐

Both name and year for 75c ☐

PRICED LOW

AT **\$3.50**

POSTPAID

**SEND FOR YOUR
BINDER TODAY . . .**

U. S. Domestic Airline Traffic for May, 1950

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MAILES **	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	REVENUE TRAFFIC	AVAILABLE TON-MAILES	% AVAILABLE TON-MAILES USED	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	320,316	157,575,000	229,049,000	68.80	809,939	552,544	2,831,764	19,237,686	30,018,466	64.09	5,281,642	5,210,047	98.36	
Boeing	56,442	19,006,000	33,971,000	55.95	111,213	84,934	152,029	2,169,281	4,424,185	49.03	965,547	952,955	99.45	
Capital	127,425	37,440,000	66,581,000	56.23	130,036	203,084	772,985	4,689,309	8,374,599	55.99	1,824,951	1,791,746	98.26	
Caribbean	5,652	446,000	1,152,000	38.72	793	• • •	2,027	38,701	112,505	34.40	45,547	45,796	99.28	
C & S	29,588	10,470,000	18,026,000	58.09	50,701	44,713	96,065	1,196,087	2,100,724	56.94	662,113	661,308	99.19	
Colonial	15,031	3,847,000	9,221,000	41.72	6,791	7,373	7,402	398,901	1,082,291	36.86	301,687	308,361	97.76	
Continental	17,514	6,037,000	14,220,000	42.45	17,442	10,869	56,977	664,209	1,480,974	44.85	503,740	499,410	99.26	
Delta	56,224	22,048,000	38,257,000	57.63	101,679	85,680	226,612	2,534,237	5,052,616	50.16	1,182,901	1,173,519	99.90	
Eastern	217,946	94,665,000	164,203,000	57.65	418,256	390,493	1,292,215	11,644,365	23,716,974	49.10	4,572,274	4,477,137	99.00	
Hawthorn	25,786	3,224,000	5,168,000	62.38	5,530	10,582	37,792	332,003	583,352	56.91	234,644	197,823	97.72	
Inland*	7,529	2,998,000	6,455,000	46.44	11,303	6,879	19,760	325,682	768,061	43.54	281,967	301,878	93.34	
NCA	29,506	8,540,000	15,595,000	54.76	28,998	22,371	48,011	918,295	1,782,250	51.52	742,604	750,510	98.43	
National	28,190	16,592,000	36,179,000	45.86	45,757	72,264	151,716	1,955,372	4,919,008	39.75	902,339	896,875	98.63	
Northeast	26,207	5,197,000	10,120,000	51.35	8,183	12,307	28,452	318,224	1,013,398	51.14	329,502	342,597	91.72	
Northwest	82,280	49,406,000	87,300,000	56.59	199,227	176,253	649,291	5,756,188	11,308,843	50.90	1,887,964	1,741,853	97.29	
Trans Pac.	5,511	694,000	1,951,000	35.57	• • •	79	969	56,372	162,348	34.72	69,736	58,017	100.00	
TWA	146,064	96,620,000	145,800,000	66.27	762,843	516,803	975,029	11,530,470	19,168,784	60.15	4,064,404	4,035,854	99.68	
United	234,778	126,543,000	184,752,000	68.49	966,407	673,168	2,446,567	16,031,643	28,426,876	56.40	4,789,532	4,665,526	99.30	
Western*	43,644	15,789,000	30,237,000	52.21	72,193	52,297	83,482	1,713,376	3,209,943	53.38	787,142	710,154	99.39	
TOTALS	1,475,633	677,137,000	1,098,237,000	61.65	3,747,338	2,884,653	9,679,147	81,710,391	147,686,187	55.32	29,430,238	28,821,366	98.61	
* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.														
** Includes air parcel post.														

U. S. All-Cargo Airline Operations, 1st Quarter, 1950

AIRLINES	TRAFFIC					REVENUES & EXPENSES							
	FREIGHT TON-MAILES	AVAILABLE TON-MAILES FLOWN	% AVAILABLE TON-MAILES USED	REVENUE PLANE-MILES	SCHEDULED MAILES	% SCHEDULED MILES COMPLETED	TOTAL OPERATING REVENUES	FREIGHT REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
January, 1950													
Air News	23,462	83,359	28.15	25,047	30,746	81.46	Figures for January are not available.						
Fly. Tiger	1,372,028	2,012,522	68.52	272,891	283,623	91.51	\$ 213,580	\$ 197,975	\$ 11,559	\$ 261,159	\$ 156,155	\$ 105,004	\$ -47,570
Slick	2,072,953	2,924,344	70.89	526,380	629,173	74.31	330,428	306,229	" " "	407,979	214,187	193,792	-77,551
US Airlines	163,678	328,740	49.78	68,845	91,193	92.70	29,905	19,164	1,498	69,880	42,276	27,602	-46,975
TOTALS	3,632,121	5,338,965	68.03	893,163	1,034,735	80.85	564,921	522,968	13,057	739,018	412,620	326,398	-174,096
February, 1950													
Air News*	25,039	77,193	32.44	22,421	26,880	81.68	35,364	34,435	" " "	29,774	24,116	5,658	5,590
Fly. Tiger	1,658,884	2,255,558	73.55	297,492	283,623	84.07	290,795	195,874	56,820	266,823	165,545	101,278	23,972
Slick	2,127,480	3,202,541	66.43	556,033	608,538	85.64	334,496	321,475	2,655	403,582	207,092	196,490	-69,086
US Airlines	213,163	311,245	55.91	76,469	100,144	80.69	26,319	22,330	3,628	61,192	32,874	28,318	-34,873
TOTALS	4,024,566	5,916,537	68.02	952,415	1,019,185	84.61	686,974	574,114	63,103	761,371	429,627	331,744	-74,397
March, 1950													
Air News	35,972	98,095	36.67	30,326	32,686	92.78	Under CAR regulations the airlines are not required to file a report of revenues and expenses for the month of March, but instead file a statement for the quarter ending March.						
Fly. Tiger	1,823,145	2,500,535	72.91	324,253	294,933	95.65							
Slick	2,893,709	4,346,349	66.55	752,642	761,528	89.97							
US Airlines	272,044	404,335	67.28	92,122	93,698	90.18							
TOTALS	5,024,870	7,351,314	68.35	1,199,343	1,182,845	91.48							
Quarter Ending March 31, 1950													
Air News	84,473	258,647	32.65	77,794	90,512	85.62	58,007	56,820	" " "	46,425	37,666	8,759	11,581
Fly. Tiger	4,854,057	6,750,615	71.83	894,636	862,179	90.47	844,461	639,296	110,400	826,338	506,894	319,445	18,123
Slick	7,094,142	10,475,234	67.72	1,835,055	1,999,239	83.22	1,136,133	1,036,242	34,366	1,288,026	680,899	607,127	-151,893
US Airlines	646,885	1,114,320	58.23	237,436	285,035	87.68	89,456	69,543	16,088	207,194	112,352	94,842	-118,738
TOTALS	12,681,557	18,606,816	68.15	3,044,921	3,236,765	85.93	2,127,057	1,801,901	160,854	2,367,983	1,337,811	1,030,173	-240,927
* Revenues and expenses are for January and February.													

Alaskan Airline Balance Sheet Data as of Dec. 31, 1949

AIRLINES	TOTAL ASSETS	CURRENT ASSETS	INVESTMENTS & SPECIAL FUNDS	OPERATING PROP. & EQUIPMENT	DEFERRED CHARGES	CURRENT LIABILITIES	LONG-TERM DEBT	DEFERRED CREDITS	OPERATING RESERVES	CAPITAL STOCK	SURPLUS
Alaska	2,738,176	1,065,845	2,032	1,487,948	177,172	1,319,056	...	10,887	98,269	597,938	712,028
Alaska Constal	435,539	131,798	720	258,975	34,706	60,447	209,000	17,213	33,561	104,927	10,791
Constal	79,898	24,786	...	46,671	8,441	64,519	1,000	1,111	736	15,850	-2,918
Elis	341,780	82,525	...	220,958	18,421	30,312	67,750	...	...	57,204	186,513
Porter Constal	737,587	394,419	234	279,285	25,942	387,205	166,514	18,292	...	320,000	-156,424
Porter North.	989,677	505,314	...	312,236	61,411	272,231	10,369	17,515	...	666,444	23,120
Reeve	322,560	122,152	...	192,284	5,189	147,318	...	24	...	288,946	-113,728
Wien Alaska	346,165	127,953	1,695	198,345	18,174	246,060	34,000	...	8,695	107,100	-52,090
TOTALS	5,991,366	2,404,792	4,881	2,956,802	349,456	2,529,148	490,633	65,042	140,861	2,158,409	606,892

U. S. International Airline Revenues & Expenses for April, 1950

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
American	\$ 301,649	\$ 254,721	\$ 6,277	\$ 4,889	\$ 322	\$ 22,040	\$ 3,929	\$	\$ 319,720	\$ 169,384	\$ 150,336	\$ -18,071
Amer. Overseas	1,678,289	1,092,460	342,585	106,661	100,696	. . . .	13,766	11,720	1,950,833	1,046,346	904,487	-272,544
Braniff	370,818	211,849	124,406	4,575	. . . .	21,916	6,898	. . . .	379,198	173,720	205,476	-8,380
C & S	333,465	175,933	124,514	725	. . . .	15,216	6,576	. . . .	323,286	160,417	162,869	10,180
Colonial	93,259	86,106	2,810	589	. . . .	1,855	221	. . . .	77,286	27,276	50,010	15,973
Eastern	61,775	52,182	3,697	. . . .	. . . .	5,367	529	. . . .	67,063	31,725	35,338	-5,288
National	143,862	127,378	4,881	. . . .	9,334	. . . .	1,819	450	141,187	51,229	89,958	2,675
Northwest	1,197,504	502,736	475,235	54,026	2,920	136,216	5,699	21,936	946,984	497,965	449,019	250,520
Panama	1,232,910	759,226	322,100	54,597	62,469	. . . .	21,559	6,858	1,146,488	525,201	615,287	92,421
PAA	4,906,362	2,975,986	1,023,134*	150,105	590,755	. . . .	90,605	20,999	4,889,749	2,189,380	2,700,369	16,613
Latin Amer.	4,237,305	2,179,194	1,566,192*	188,286	223,676	. . . .	39,692	29,111	3,881,087	2,051,155	1,829,932	356,216
Atlantic	3,098,016	1,088,943	1,646,565*	106,106	164,586	. . . .	15,645	43,050	2,811,126	1,565,508	1,245,618	286,890
Pacific	416,696	187,104	134,645*	. . . .	83,959	. . . .	1,460	10,300	393,597	187,969	205,628	23,099
Alaska	3,185,786	1,926,137	759,893	242,048	. . . .	188,034	38,369	8,500	3,073,462	1,581,184	1,492,278	112,324
TWA	320,939	259,071	40,448	. . . .	. . . .	8,085	1,601	. . . .	498,428	324,394	174,034	-177,489
United	21,578,635	11,876,628	6,577,382	912,607	1,237,817	398,699	248,368	152,924	20,893,494	10,582,853	10,310,641	685,141
TOTALS												

* Represents company's estimate of amount which should be received in accordance with the terms of the Civil Aeronautics Act when permanent rates are established. Estimate exceeds temporary rates in effect by:
 Latin American Div. \$420,884; Atlantic Div. \$757,101; Pacific Div. \$66,165; Alaska \$95,191

NOTE: Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. Feeder Airline Revenues & Expenses for April, 1950

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
All American	\$ 222,794	\$ 97,188	\$ 120,791	\$ 3,214	\$. . .	\$ 349	\$. . .	\$ 258,174	\$ 128,480	\$ 129,694	\$ -35,380
Bonanza	68,358	22,161	45,311	63	723	99	. . .	57,591	27,900	29,691	10,767
Central	57,552	4,440	52,415	. . .	. . .	. . .	38	54,491	26,135	28,356	3,061
Challenger	87,195	23,236	62,765	446	535	188	. . .	94,396	44,629	49,767	-7,201
Empire	81,423	31,135	48,624	390	. . .	166	727	75,400	39,518	35,882	6,022
Mid-West	52,508	3,360	49,130	. . .	. . .	12	. . .	49,283	27,660	21,623	3,225
Monarch	135,845	34,347	96,400	655	2,310	314	742	117,203	61,591	55,612	18,641
Piedmont	241,527	119,649	115,332	1,805	2,252	1,025	987	226,712	128,642	98,070	14,814
Pioneer	275,964	147,289	120,029	1,333	2,884	896	. . .	253,452	122,096	131,356	22,512
Robinson	270,946	48,851	220,113*	903	720	149	113	101,019	52,837	48,182	169,927
Southern	113,619	25,559	86,513	931	. . .	164	. . .	133,504	66,411	67,093	-19,885
Southwest	181,310	87,587	87,056	1,704	3,572	520	80	155,413	72,014	83,399	25,897
Trans-Texas	197,836	47,998	146,664	1,126	1,585	274	. . .	185,583	91,304	94,279	12,253
Turner	55,192	8,050	36,142	390	. . .	85	10,536	53,637	30,447	23,190	1,555
West Coast	106,428	44,947	60,249	561	. . .	77	. . .	101,614	47,824	53,790	4,814
Wiggins	16,666	1,156	15,331	. . .	. . .	2	178	8,991	10,628	10,628	-2,953
Wis. Central	126,795	29,760	95,355	1,396	. . .	166	. . .	139,837	73,294	66,543	-13,042
TOTALS	2,291,958	776,713	1,459,420	14,917	14,581	4,486	13,401	2,076,928	1,049,773	1,027,155	215,027
Hel. Air Serv.	29,360	. . . .	29,355	. . .	Helicopter Mail Service	. . .	. . .	27,644	15,342	12,302	1,716
Los Angeles	35,122	. . . .	35,122	. . .	. . .	. . .	. . .	35,770	24,233	11,537	-648

* Includes retroactive mail payment.

NOTE: Figures are taken from monthly reports filed by the airlines with CAB. The data are tentative and subject to later change.

Alaskan Airline Revenues & Expenses for 1949

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
Alaska	\$ 4,046,655	\$ 338,426	\$ 525,715	\$ 89,628	\$. . .	\$ 14,318	\$ 2,919,608	\$ 5,542,094	\$ 3,343,315	\$ 2,198,779	\$ -1,495,439
Alas. Coastal	534,110	120,404	129,799	27,801	12,564	6,640	44,602	527,943	251,192	276,751	6,267
Cordova	91,278	36,231	20,302	. . . .	13,354	829	20,022	112,263	56,873	55,390	-20,985
Elise	461,363	262,509	124,723	36,502	. . . .	3,177	33,402	440,734	177,261	263,473	20,629
North. Consol.	886,193	253,022	461,332*	3,683	81,449	3,864	65,264	855,476	484,906	370,570	30,718
Pacific North.	1,437,464	745,647	393,354	94,897	. . . .	14,208	180,992	1,543,598	764,194	779,402	-106,131
Reeve	329,335	98,091	96,697	. . . .	59,730	832	72,259	402,807	253,041	149,766	-73,472
Wien Alaska	709,864	143,205	268,025	. . . .	131,569	. . . .	62,900	752,737	436,400	314,336	-42,873
TOTALS	8,496,262	2,188,207	2,121,947	247,511	298,666	43,868	3,999,049	10,177,650	5,769,202	4,408,447	-1,681,386

* Includes retroactive mail payment.

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AIRPORTS

Including Features Formerly In AIRPORTS AND AIR CARRIERS Magazine

Airport Traffic Potential by Formula

By KEITH SAUNDERS

ON THE THEORY that estimates of the air traffic potential of communities have long leaned toward the optimistic side, the Civil Aeronautics Administration's Office of Airports has now come up with a scientifically devised formula which it thinks will make possible more accurate estimates of this nature in the future.

This newest CAA planning study, "Effective Community Air Traffic Potential," should be of keen interest and considerable benefit to communities that want to know how large an airport they are justified in building and to airlines that want to know whether it is worth their while at all to serve a given city or to increase their schedules to a city already served.

Based on previous studies it has made, CAA arrived at the conclusion that:

(1) a community's traffic potential is vitally affected by the size and economic character of the cities surrounding it, and

(2) it varies considerably in accordance with the density of cities in the area, the distances between them and other communities, the natural obstacles to ground transportation in the area, and a whole series of man-made or management factors such as directness of airline connections, frequency and time of schedules, etc.

Basic Principles

Proceeding from the major premise that the air traffic potential of a given community cannot be realized unless appropriate service is provided for this community with the principal cities with which it has a close affinity or a strong community of interest, CAA set up the following basic principles for determining community of interest:

1. Effect of population mass.

The traffic between any pair of cities will vary in accordance with the product of the population of the

two cities. A given community will naturally have the largest portion of its traffic, all other things being equal, with the largest city or the largest concentration of population with which it will be connected.

2. Effect of distance.

The traffic between any pair of cities will vary inversely with the distance between them. This principal, CAA says, is valid for all modes of transportation, but in air transportation two qualifications must be made.

a. Air transportation usually has about a 15% advantage of shorter distance over surface transportation, and when air distance is pronouncedly shorter than the ground distance cities benefitting from this condition tend to divert greater proportions of their total traffic to transportation by air.

b. Air transportation today is usually not competitive with rail, bus or private automobile transportation for very short distances. Experience has demonstrated that the minimum competitive distance for airline passenger transportation lies around 100 miles unless there are counter-balancing barriers to surface transportation.

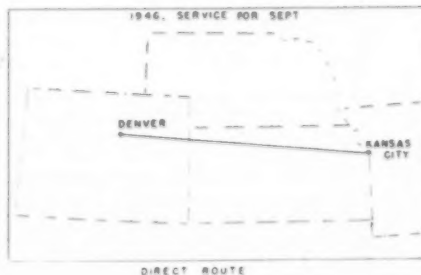
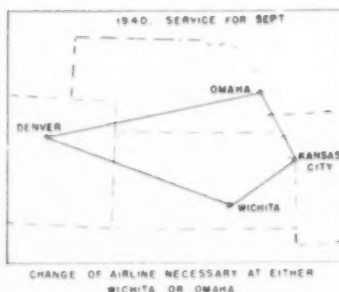
3. Effect of economic character and purchasing power.

The traffic between any pair of communities varies in accordance with the traffic-generating power of each of the communities, and the potential of any given city is related not only to its population size but also to its basic economic character. The average community classified as a marketing center, because of superiority of purchasing power, as demonstrated in previous CAA studies, will generally generate more passengers than the average city of the same size classified as industrial. Therefore, the traffic between two marketing centers in a given size group will generally be several times as large as the traffic between two industrials.

4. Effect of area density.

The traffic between any pair of cities varies in accordance with the density of cities in the geographic area. Traffic between two cities in a geographic area which has no other cities of comparable size will be much higher than between two cities in a geographic area which has many cities of the same approximate size.

Of the four basic principles here-



Effect of Cut-Off—These drawings illustrate graphically what effect airline connections have on the air traffic potential of a given city or cities. Drawing at left shows indirect air routings between Kansas City and Denver in September, 1940, when a change of airline was necessary at either Wichita and Omaha. In that month only 29 passengers flew between the two cities. These comprising 1.20% of Denver's air traffic for the month and 0.21% of Kansas City's. In September, 1946, when there was a direct air service between the two cities, traffic soared to 1,484 passengers, comprising 5.70% of Denver's traffic and 4.63% of Kansas City's.

AIRPORT NEWS DIGEST

- **Recommendations made by the Airport Use Committee** at the nine major airports visited by its working group are being screened and evaluated for the purpose of selecting a set of recommendations that will be helpful in breaking air traffic bottlenecks at all terminal-type airports.
- **CAA's Airports Advisory Committee** has recommended that a subcommittee from its group be designated to meet with representatives of the Air Transport Association to study the question of the basis of rates and charges at airports. Meanwhile, the committee will compile data on the present basis of rates and charges at all airports for its own guidance.
- **At Greater Cincinnati Airport**, which has a free parking lot and also has parking meters on the circle in front of the administration building, cars found parked in violation in a metered space are tagged with a unique type of parking "ticket." One side bears a welcome greeting and the other the following verse: "We're sure you had a reason, like no change or just forgot, or maybe you just didn't see our big free parking lot. Now if we wrote a ticket, we would surely spoil your day; since all our guests are special guests, we're more than glad to pay."
- **The Airports Advisory Committee** has asked CAA to grant waivers to Atlanta, Fort Worth, Kansas City, Memphis and Miami to experiment with various types of runway markings, including the billboard type. Committee members feel that present runway marking requirements under TSO-10 "leave much to be desired," and think there should be a full experimentation before such markings are universally standardized.
- **The Baton Rouge Airport Commission** has paved the way for completion of the new \$250,000 administration building at Harding Field by selling utility rights at the field for \$30,000 and authorizing the mayor to apply for a matching grant from the CAA.
- **Ground has been broken for a three-story, \$2,000,000 terminal building** at the new Fort Worth Airport and also for a \$2,000,000 combination office and hangar building to house American Airlines' regional activities. The new airport, originally called Midway Field and then Greater Fort Worth International Airport, has now been officially named Amon G. Carter Field, honoring the Fort Worth publisher and aviation enthusiast.
- **The Federal government** has agreed to transfer 23.7 acres of land between the Harrisburg State Airport and the New Cumberland Army Depot to the Commonwealth of Pennsylvania. The additional land will permit expansion of the airport's present runways from 4000 feet to 5000 feet.
- **Charles B. Moore, manager of the El Paso municipal airport** (Anderson Field), advises us that the city council has formally changed the name of the field to El Paso International Airport.
- **Despite the possibility of a referendum at the November 7 election** to have the Detroit City Airport closed, the common council has approved a \$282,000 contract for construction of taxiways at the field.
- **The San Francisco Art Commission** has had a change of mind and has approved preliminary plans for the new administration building at the Municipal Airport. This will permit work to be started on the foundations of the structure. Final plans will come up for approval later.
- **The City Planning Commission at Richmond, Va.,** has approved an increase in the amount the city will spend on Byrd Airport improvements during the coming fiscal year from \$69,443 to \$119,443. Principal improvement will be a new cut-off taxiway across the center of the field.
- **Dedication ceremonies for Galveston's new \$180,000 terminal and administration building** at the municipal airport will be held Sunday, August 6.

tofore outlined, the first two, relating to population mass and inter-city distance, can be measured fairly accurately by a mathematical formula.

Traffic Formula

The traffic between community "X" and other cities, with economic character and area density held constant, will be roughly proportionate to the product of the populations of "X" and each of the other cities divided by the distance between each pair of cities. In other words, the formula is $p \times p$ (population of "X" times population of "Y" divided by distance between "X" and "Y").

As previously mentioned, there are a number of other factors which are not susceptible to mathematical measurement but are important in evaluating community air passenger generation and distribution. As an example, CAA points out that when air connections between Denver and Kansas City were indirect, Kansas City contributed only slightly over 1% of Denver's total air traffic and Denver contributed only 1/5 of 1% of Kansas City's total. However, when direct air connections between the two cities were established, they exchanged about 5% of their air passengers with each other.

In September, 1946, when the only air service between Boise and Sacramento was roundabout via Salt Lake City, there were five air passengers between the pair, whereas in September, 1948, when a direct route had been established via Reno, traffic between the two cities rose to 452 passengers.

These illustrations, while perhaps extreme, demonstrate the necessity of taking into account management factors of this type in conjunction with the basic mathematical formula in estimating community air passenger generation and distribution.

Florida Airways' Problem

Applying its basic principles to the feeder route formerly served by Florida Airways, CAA showed graphically in its study why the Florida feeder was never able to make a good showing trafficwise.

First of all, the sheer smallness of size of most of the communities militated against the development of any sizeable air traffic in accordance with the $p \times p$ formula.

Then there was the matter of proximity. Practically all of the Florida cities and towns were less than 70 miles away from their nearest largest neighboring city, which is well below effective air distance.

"It is no accident, but according to the basic principles of air traffic distribution, that the Florida feeder communities had little traffic with their nearest largest neighbor," said



Isla Verde—Air view of the big Isla Verde International Airport, now being constructed along the shore of the Atlantic Ocean about 20 minutes out of San Juan, Puerto Rico, which is seen dimly in the background. An express highway will link the airport with the island capital. The Insular government is putting up \$7,000,000 and the U. S. government \$5,000,000 toward cost of the project. Photo by courtesy of Hamilton Wright Organization, Inc., of N. Y.

CAA. "Even more important, the effect of this proximity to larger neighboring cities is extremely deleterious to airline traffic generation of the smaller city, since the most important sector of the potential of any such community, namely that portion with the nearest largest city, does not develop at all. Proximity to a larger neighbor, therefore, in effect, kills off practically all the air traffic of the smaller community."

SWA's System

By way of contrast, the authors of the CAA study then examined Southwest Airways' route, one of the most productive of the feeder lines at present.

Although the communities on SWA's route are on the whole no larger than their Florida counterparts previously examined, CAA found that their per capita airline passenger indices are among the highest in the United States.

A major factor in this good showing is the fact that both Los Angeles and San Francisco are on Southwest's route, and the small California cities along the coastal plain and in the valleys have the advantage of direct air connections with tremendous masses of population. By contrast, the larger cities on the Florida Airways route, Jacksonville and Orlando, had populations of only 196,000 and 37,000, respectively.

A smaller city of a given size, say 10,000 population, would obviously

have much more traffic with a city of 3,000,000 people, such as Los Angeles, than with a city of 200,000, such as Jacksonville.

Longer Distances

Another factor in Southwest's favor is that 13 of the 18 communities on its route are located at an optimum distance, between 100 and 350 miles, from the nearest metropolis. Twelve of these have 40% or more of all their traffic with either San Francisco or Los Angeles.

On the other hand, the poorest air passenger producers among the 18 cities on the SWA route are the five communities which are too close to their nearest metropolis, that is, within less than 100 miles. These five cities were on the average only 58 miles away from the nearest metropolis, in contrast with an average of 154 miles for all the 18 Southwest Airways feeder stops. As a result, the average passenger index of these five communities was less than nine enplaned passengers per 100 population, as against an average of 32 for all 18 communities on the route.

In its final chapter, the CAA publication makes an analysis of a number of cities along a proposed airline route sector to demonstrate the relative ease of application of its basis principles of air transportation in estimating the effective potential and hence the airport requirements of communities receiving consideration

for airline service as well as communities already served.

CAA cautions, however, that analyses of this type must be made on an individual community basis and in terms of known or possible connections.

Copies of "Effective Community Air Traffic Potential" may be obtained from the Office of Aviation Information, Civil Aeronautics Administration, Department of Commerce, Washington 25, D. C.

CAA Airport Grant Offers

For the two weeks ended June 13, the Civil Aeronautics Administration made Federal-aid airport grant offers totaling \$5,471,450 to 46 communities, as follows, with airport classes in parentheses:

Alaska: Dillingham Airport (2), \$115,500; Ninilchik Municipal (2), \$15,000; St. Paul Island (3), \$60,000; Seideria seaplane base, \$4,500.

Arizona: Flagstaff Mun. (3), \$21,820 (two grants).

Arkansas: Batesville Mun. (2), \$12,437; Ft. Smith Mun. (4), \$59,537; Jonesboro Mun. (3), \$5,698.

California: Corning (1), \$3,772; Fort Jones (2), \$7,959; Hammer Field, Fresno (6), \$48,884; Jackson (1), \$4,710; Los Angeles International (6), \$1,287,291 (two grants); Van Nuys (5), \$19,058; Merced (3), \$20,166; Peninsula Airport, Monterey (4), \$5,414; Oroville Mun. (5), \$6,470; San Francisco Mun. (7), \$211,431; San Jose Mun. (4), \$140,722; Watsonville Mun. (3), \$2,935.

Colorado: Stapleton Airfield, Denver (6), \$760,413 (two grants).

Florida: Miami International (7), \$11,550.

Idaho: Couer d'Alene (4), \$2,642.

Kentucky: Kentucky Dam State Park (2), \$25,000; Standiford Field, Louisville (4), \$63,000.

Louisiana: Lafayette Mun. (4), \$41,000; Shreveport Mun. No. 2 (5), \$375,000.

Massachusetts: Logan International, Boston (6), \$700,000.

Michigan: Kent County Airport, Grand Rapids (5), \$15,000.

Minnesota: Little Falls Mun. (2), \$7,600; Lake Elmo Airport, St. Paul (1), \$60,000.

Mississippi: Gulfport Mun. (6), \$7,879.

Missouri: Gideon Mun. (3), \$29,500; Kansas City Mun. (4), \$728,320 (four grants).

Nebraska: Fairbury Mun. (2), \$33,960; Minden Mun. (1), \$6,000.

Ohio: Canton-Akron Airport (4), \$36,000; urban Mun. (2), \$9,300; Zanesville Mun. (4), \$23,000.

Oklahoma: McAllister (3), \$202,695; Tulsa Mun. No. 1 (6), \$43,682.

Pennsylvania: Bradford Mun. (3), \$37,500.

South Dakota: Watertown Mun. (5), \$21,202.

Tennessee: Hohenwald Mun. (1), \$9,000.

Texas: Midland-Odessa (5), \$51,203.

Wyoming: Cheyenne Mun. (5), \$33,500; Douglas Mun. (2), \$26,000; Gillette Mun. (3), \$17,100; Riverton Mun. (3), \$21,000.

These boosted to 1,339 the total of grant offers made under the Federal Airport Program, and increased the Federal funds involved to \$115,754,822.

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AIRPORTS



WATTPAR AEROCELL fueling system in operation at Teterboro Air Terminal, N. J.

Hydraulic-Lift Fueling Unit Cuts Gassing Time & Cost

A NEW ANSWER to the question of how to eliminate some of the hazards and some of the costliness of present airport fueling methods is provided in a prototype system now being tested at Teterboro Air Terminal in conjunction with the Airport Engineer's Office of the Port of New York Authority.

This system, also under consideration for installation at Philadelphia International Airport and at Fort Worth's big new airport, employs a hydraulically-operated circular steel platform or "pit," which can be raised to above wing height when in use and the top of which is flush with the apron when not in use.

It eliminates expensive mobile units (tankers), ladders, loss of time, and hazardous obstructions, brings the dispensing equipment together with the fueling attendant to the plane's wing in a matter of seconds, and is out of sight and out of the way in an equally short time after performing its function.

Known as the Wattpar Aerocell fueling system, it is the brain child of two New York engineers, A. E. Watts, Jr., and Jack R. Parker, and is manufactured by the Combustion Equipment Division of The Todd Shipyards Corp.

Safe and Economical

Because of its economy (it dispenses 1,000 gallons of fuel at a cost

of about 15c), and especially because of its safety features, the Aerocell prototype at Teterboro has aroused considerable interest on the part of airport operators, oil companies and airlines. Virtually foolproof, the system works as follows:

The plane to be refueled stops with its main wheels resting on two painted markers. Flush with the apron are two steel disks, one on each side of the fuselage, located so that they are slightly behind the trailing edges of the wings.

An attendant goes to each disk or platform, squats on one knee, opens the control box cover and actuates the "lift" control. Almost immediately a circular guard railing projects up three feet from the surface to protect him on his ride upward to wing level. In the steel Aerocell on which he rises are his gas nozzle, hose and meter, and a CO₂ nozzle and hose.

Extension to Wing

After the cell has risen to the desired elevation, controlled by a "dead-man" type switch at the attendant's fingertips, the attendant presses another switch which automatically projects an extension platform slightly over the wing's surface to enable him to walk between the cell and the tank connection. He then presses a fueling switch, takes the dispensing hose across the walkway and inserts the nozzle into the tank.

Fueling over, he returns across the

AMERICAN AVIATION

walkway to the cell, reels in the hose, retracts the walkway, presses a "down" switch and descends to apron level. He then closes the control box cover, the guard rail disappears, and the reinforced steel cell cover is then flush with the apron and ready for any type of plane to ride over it with a margin of safety.

The Aerocell has been planned with safety as the prime consideration. During the fueling or defueling operation, there are only approximately 35 gallons of fuel above ground. In the secured or idle position, fuel pressure is kept out of the entire system automatically from a point entering the valve box. The pipe lines feeding the unit are under low pressure—simply a positive head—to supply fuel to the booster pumps of the cell.

All heavy access doors are cam operated automatically when the unit begins to rise, so that the attendant does not have to strain himself or be subjected to injury in dropping a cover, etc. The automatic platform extension, with checkered plate, gives the attendant a sure footing and at the same time saves wear on the delicate wing surfaces during fueling operations. This extension, incidentally, is fitted with a "feeler" device which stops its movement the instant it comes into contact with the wing or any other object.

Vapor Detector

A Wheatstone bridge vapor detector which "breathes" the atmosphere in the unit guards against the accumulation of explosive vapors. When danger of combustion is present, the vapor detector automatically shuts off the flow of fuel in either the fueling or defueling operation, sounds an alarm and simultaneously discharges CO₂ into the cell.

A separate and independent CO₂ system is provided in one of the compartments of the fueling platform to provide protection for the plane.

The entire unit is grounded to provide the same electrical potential between parts. A grounding reel is located at the valve box.

The cell cannot be lowered from any elevation without first bringing the extension platform back into the confines of the cell, the platform motivating power being connected to the "lift" control for safety purposes.

Floodlights are recessed into the sides of the cell chassis to provide light for night fueling operations, heretofore somewhat of a problem.

The Aerocell is designed for tandem use, that is, one cell alongside each wing. The prototype contains one dispensing outlet, but a manifold and evacuation system is arranged to permit fueling with two different grades of fuel without commingling.

The cell can be supplied with two



CLOSEUP of Aerocell shows extension platform (foreground), gas and fire extinguisher nozzles ready for use.

types of pumping systems, either with pumps and motors and an integral part of each unit or with a submerged pump remote control system. In this system, there are no pumps for obtaining gasoline pressure in the dispensing units themselves. Instead,

a centrifugal pump is mounted over each gasoline storage tank and these can supply gasoline under pressure to a number of cells on the field, depending, of course, on the capacity of the pumps, size of lines and the distances involved.

Where pumps are provided as an integral part of the cell units (as in a low pressure system), one booster pump is used in each cell for both fueling and defueling through a system of solenoid valves automatically controlled in a simple arrangement.

The entire fueling-defueling unit is mounted on a common chassis located in the valve box and may be removed as one piece quite conveniently for inspection and maintenance. It is noted in this connection that maintenance and inspection of the entire dispensing unit is easily facilitated by a quick removal of the cell cowlings when the unit is elevated to a position just above ground level, permitting access at a man's chest level.

Operating costs are small; the Aerocell needs only electrical power, and that for only a few minutes at a time. Maintenance problems consist almost entirely of ordinary care given to hoses, reels and pumps.



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Emergency Planning Skips Private Aviation

By BARBARA WARD

IT IS BEING said in Washington that, in the event of war emergency, the only plan that exists for private aviation is the plan to eliminate it. The past month has brought the realization that civilian pilots, airport operators, fixed-base operators and lightplane manufacturers have no role in any present war emergency plan which will go into effect if atomic warfare strikes the United States, regardless of the services they can perform.

Civilian aviation faces the possibility of a complete shut-down of operations other than Civil Air Patrol and military contract training, if the war emergency grows. With gas certain to be rationed, the survival of base operators and privately owned airfields depends on recognition by the Air Force and the National Security Resources Board that they render essential services.

The lightplane industry in 1950 is doing work that it was carrying out in 1941 only on a limited scale. The 26,013 civil aircraft and 129,947 pilots certificated in 1941 had grown to 95,997 aircraft and 491,306 pilots by 1948. And, far from being curtailed, the services of these planes and pilots could become more important in an emergency.

Yet, in the entire 301 pages of the "Civil Defense for National Security" plan recommended by the Office of Civil Defense Planning, the only direct reference to use of civil aviation in an emergency is: "Every advantage should be taken of available air transportation in planning the civil defense program. It offers rapid movement, considerable capacity and some flexibility."

That is a relatively incontestable statement. But not much can be said for it as a plan.

Role of Civil Air Patrol

Rumors that, in event of an emergency, all civilian flying would be curtailed and then released to the Civil Air Patrol find some verification in CAP Headquarters. Colonel Wm. G. Boothe, CAP deputy commander, states, "I can very well conceive that all civilian flying will be done by us. Flying would have to be properly cleared and controlled and I don't know of any other agency that exists on a national scale."

It is questionable as to whether the Civil Air Patrol should be expected to carry out all civilian flying. It has

a tremendous job to do if it confines itself to its specified duties of search and rescue, aerial reconnaissance of traffic congestion and devastated areas, anti-sabotage patrol, patrol of pipeline facilities and public utilities, supply of critical areas, maintaining a radio communications net, operating an air carrier service, and indoctrinating and screening prospective Air Force personnel.

However, CAP might well act as a police force over aircraft and pilots to check that they have been properly screened and cleared for individual flights by CAA personnel. With its over 6,000 licensed radio stations which operate on frequencies assigned to it by the Air Force, it is well equipped as an enforcement agent.

But CAP operating strength is low. It now is down to approximately 3,000 aircraft compared with the 9,000 aircraft listed for it in the "Civil Defense for National Security" plan. About 2,500 of the planes are privately owned and on call; about 250 planes have been donated; and about 250 planes are loaned or assigned to CAP by the Air Forces. Of the latter, about 60 planes have been taken back by the Air Force within the past month.

In CAP's 52 state and territorial wings, there are varying numbers of Groups and Squadrons operating from a total of 1,051 locations. At each of these, there is in being a military type Table of Organization, although the engineering officer need not be an A and E mechanic and the commanding officer of the unit need not be a pilot. In all, CAP has 8,000 pilot members.

The 151,007 active CAP senior members who are indoctrinated in aviation and have completed set ground school courses constitute an organized group that could be extremely useful in meeting wartime aviation needs in such activities as aircraft spotters. And the 21,386 CAP cadets now taking training will move ahead and make room for more in an established and well organized nucleus organization.

Small Airports Important

What is unrecognized by most emergency planners is the value of the 6,500 airports listed by CAA to the transportation system of the United States. If civil aviation is grounded and if, as an inevitable result, many small airports close down operations, airport facilities have been



Airline Service—

United Air Lines' employees are providing transient aircraft service at Rock Springs, Wyoming. This good-will gesture on the part of United fills a previous gap in servicing facilities at the field. Pilot Robert Smith, Eaton Rapids, Mich., is shown as two United attendants gas a PT-17 belonging to the Michigan Wing of Civil Air Patrol. The plane was one of nine en route from Air Force storage bases in Utah.

eliminated as surely as if they have been bombed.

Small airports assume importance when it is considered that they make dispersed targets, as opposed to the convenient bulls eye of the large municipal airport. In addition, in many localities which contain essential industries, the small airport is the only landing facility available.

Role of Operator

The fixed-base operator who maintains a flying school or maintenance shop is a key person. He has the equipment and the know-how to put it in use.

He has the potential in equipment and facilities which can produce trained airmen for the armed forces. Civilian flight schools proved their usefulness during World War II when they turned out approximately 250,000 military pilots from primary and secondary contract flight schools. Wayne Weishaar, secretary of the Aeronautical Training Society composed of the larger aviation schools, points out that "We know our mobilization potential, and it is there when it is needed. Thirty-one of our member flight schools in 20 states now have the equipment and facilities to start 9,082 military cadets in their flying training."

The importance of civilian maintenance facilities to the Air Force recently was stressed in a Senate Committee statement, "that it is essential to an adequate mobilization base for the Air Force that commercial contractors be utilized to the greatest extent consistent with national security."

And service and maintenance needs of executive aircraft will continue. In contrast to 1941 when there were few executive aircraft, it now is estimated that there are approximately 8,000 such aircraft owned and operated for company business. In an all-out emergency, these aircraft would be doubly important in easing airline traffic by transporting personnel of essential industries direct to their destinations.

Food Production Aid

Aerial crop dusting, spraying, seeding and fertilizing have grown to greater proportions in 1950 than in any previous year. As the most effective and efficient method of combating insects and increasing conservation and food production, they will be particularly valuable when manpower is short.

Charter transportation now provided by fixed-base operators might well be continued on a priority basis.

The newly organized National Air Taxi Service, to provide lightplane connections from rural areas to airline terminals will enable passengers

to go "by air all the way." This additional air network, recently approved by the airlines' Air Transport Association, will extend air connections to thousands of communities.

As C. A. Parker, executive director of National Aviation Trades Association in Washington, points out, "With the event of actual hostilities, I think the National Air Taxi Conference has a ten-fold greater potential than when it was formed. It provides an organization already set up and integrated with the airlines to provide fast, direct transportation."

Flight Restrictions

CAA officials say there is at present no foreseeable need for flight restrictions on civilian flying. And should an all-out emergency develop, steps would be taken, not to stop private flying but to assure that all aircraft are properly cleared and can be identified.

Small aircraft would become important communication and transportation equipment and would continue in use, and executive aircraft would be encouraged to continue operations.

However, filing of flight plans probably would be required rather than requested as at present. And the additional requirement can be expected that aircraft carry two-way radio equipment to enable giving position reports and receiving any necessary instructions.

In the event of a declared emergency, since radar operates on line of sight and does not follow the curvature of the earth, hostile aircraft could be expected to come in at tree-top level to avoid detection. For this reason, except in the interior of the United States, a flight plan and two-way radio then might be required even of aircraft flying locally.

Lightplane Manufacturers

Lightplane manufacturers are as much at loose ends as the rest of the private aviation industry as to what they can expect of a war emergency. Joseph T. Geuting, Jr., head of the Personal Aircraft Council of Aviation Industries Association, explains: "If we knew what to expect, we could be thinking about the problems of material and production and a reservoir of equipment and personnel. Most small aircraft plants do not have their defense role set. And while we have no illusion about our ability to build eagles, we can sure build a lot of feathers."

The best way to foresee the lightplane war future is to look at what happened during World War II. The small aircraft companies turned out lightplanes, but in addition did millions of dollars of sub-contract work

in non-aviation products. Ryan Aeronautical Co. grew from an aviation school and manufacturer of training planes to expand its research facilities until today only roughly one-third of its production is in personal aircraft. In addition, it is working on an Air Force guided missile contract and turns out specially processed stainless-steel spare parts.

In the current picture, Beech Aircraft Co. recently completed a large Navy contract for rebuilding about 1,500 aircraft. Aeronca Aircraft Corp. has three Air Force contracts totaling over \$1,300,000, two of which are for maintenance stands for the Boeing B-50 and the Convair B-36 and the third of which is for tow targets, something new on the Aeronca production line.

Cessna's Liaison

The only lightplane company with definite aircraft production commitments from the military is Cessna Aircraft which recently won the Army Field Forces liaison plane contract for 400 L-19A reconnaissance planes with spare parts and equipment totaling about \$5,000,000. In addition, Cessna has a smaller Air Force contract totaling \$170,000 for the Air Force version of the Cessna 190, to be used in search and rescue.

But although the lightplane that is needed by the USAF Air Rescue Service is the same lightplane that is needed by the Army Field Forces for aerial reconnaissance and transportation, and although it is badly needed in private aviation, manufacturers and the military have yet to get together on any long-range contract to develop it. The Air Force continues to "buy off the shelf" with no long-range plan for developing the ideal lightplane, and no apparent planning for use of lightplane manufacturing facilities in the event of war.

That makes the lack of planning complete.

CAA Specification Changes

Piper PA-18 is authorized for crop spraying installation of Sevdly-Sorenson Model 10, high or low gallonage with a required placard not to exceed 382 lbs., by Specification 1A2.

Beech 35 aircraft are authorized with installation of a 10-gallon fuel tank in accordance with instructions of Aircraftmen, Inc., Oklahoma City, by Specification AT77.

Cessna 140A is approved with Edo 88-1650 and 92-1400 floats, by Specification 5A2.

Piper J3C Cub is approved with tricycle landing gear, Testerman model SPM-1, by Specification A691.

Piper AC-20 is approved for Edo Model 88-1650 floats and Federal A-1850 skis, by Specification 1A4.

Bellanca 14 aircraft are approved with Hartzell controllable propeller, by Specification 1A3.

For Local Operators

Covered Wagon Service

Now that aviation has outgrown its wind socks and wears tetrahedrons, it is generally accepted among most airport operators as a serious business. But as W. B. Lankard, assistant general manager of Gulf Oil Corp.'s Airport Division, recently pointed out, private plane servicing has fallen behind the industry and still is where auto servicing was 30 years ago when a garageman had to be pulled away from his work to fill a gasoline tank.

At the risk of creating another association in an already overloaded Washington, it is suggested that there is a definite need for fixed-base operators to get together to guarantee the airplane owner certain standards of service. At the same time, by cooperating among themselves, they could hit at some of the ills of the business.

Imagine what it would mean if a pilot flying cross country could look down on "ASA" air marked on the roof of a hangar and know that if he landed at that field he could expect good service and maintenance at a fair flat rate charge. And know that, if there was a part he needed which was not available on the field, the operator, as an Air Service Association member, could put his finger on it and obtain it in a matter of hours.

Today, what is a pilot up against if he has engine trouble on a cross-country flight? Unless he has flown the route before and knows the area, he has no way of telling which airfield has maintenance equipment and mechanics who know his type of plane, or which operator at any one field can be depended on to do a good job. It's his own gamble. If the mechanics mess up the job, if they spend four hours finding the right hydraulic line and educating themselves at his expense, he pays for it.

And, if the engine needs a part which is not available on the field, the accepted practice is to wire to the plane's home base for the part, or send to the factory or one of a few distributors, all of whom may be several states away. Yet, within 200 miles of that airport, another operator probably has the part collecting dust in his inventory.

That hurts. It not only hurts the customer's pocketbook but the delay and inconvenience hurt aviation.

The businessman who has invested dollars in a plane to save time and who finds himself down with engine trouble, time on his hands and a conference in St. Louis is a hard customer to keep. If it happens at Butler Aviation at Washington National Airport, and if his engine is a Continental or a Pratt and Whitney, he can hibernate in the coffee shop with a doughnut: everything is under control. A wire from Butler to Airwork Corporation, Millville, N. J., will bring a reworked and overhauled exchange engine in a few hours, and it will be a matter of few hours while Butler mechanics hang it. If the engine has less than 600 hours, it sells for one price and, if more than 600 hours, for a lower price. Exchange value is given on the damaged engine.

But, if serious engine trouble occurs at most airports in the country, or if it happens at Butler in Washington to a Lycoming engine, the answer probably will be the railroad.

Executive aircraft particularly face an unsolved maintenance problem. Since they operate with higher powered engines than are generally used, few fixed-base operators can afford the investment that would be required to carry an inventory of parts and to keep maintenance men trained on their systems. One owner of a Lodestar goes to the additional expense of carrying a mechanic on trips. His was the regrettable experience of having hydraulic trouble and finding mechanics tearing equipment out of the blue room, under the impression that it involved the hydraulic tank.

Lodestar or Taylorcraft, excessive charges made on maintenance work become considerably more than the customer's problem when they become the reason for owners getting rid of their airplanes. Years ago, the automobile industry realized there would have to be set rates before the business could grow. Recently, the *Badger Air News*, published by Wisconsin Aeronautic Commission, reported that one of their fixed-base operators has started notifying owners of aircraft

of new changes required by CAA Airworthiness Directives. He sets a flat rate for doing the work and the *Badger News* continues, "Flat rate or flat broke? Think it over,"

Gulf Servicing Plan

Gulf Aviation Service has published a new servicing plan which is recommended for approximately 500 Gulf aviation dealers. These eighteen Gulf points of service could become a servicing bible:

1. Be waiting to greet the plane.
2. Use standard taxiing signals in directing it to park.
3. Approach the plane carefully, using caution with the prop as you chock the wheels.
4. Give a friendly greeting and, if there are women in the plane, touch your fingers to the visor of your cap.
5. Help passengers in alighting and with their luggage.
6. Offer information on rest rooms, weather facilities and restaurants.
7. Take the order, suggesting a "fill up" and checking the octane rating. Ask, "How high do you carry your oil?" and check as to the kind of windshield cleaner you should use.
8. Ask the pilot his plans.
9. Attach a grounding wire to the plane to discharge static electricity.
10. Refuel the plane, keeping a fire extinguisher at hand. Do not hang the hose nozzle in the tank opening as the weight might spring the tank spout. Don't overflow the gas. Replace the tank cap and double check that it is secure.
11. Add oil.
12. Secure oil cap and access flap.
13. Write out the bill.
14. Clean the windshield.
15. Wipe the cowlings clean of fingerprints and oil.
16. Clean out the cockpit and empty the ash trays.
17. Give the plane an overall check for tire, prop damage, etc.
18. Be there with the proper change when the pilot returns.

For the pilot who is staying overnight, Gulf dealers will arrange hotel accommodations, transportation from the field, give weather and flight information phone numbers, and find out what time the pilot intends to leave in the morning so that the plane will be ready on the line with the bill made out. Before it is hangared, the aircraft will be inspected for damage and the pilot called if any service appears desirable.

In addition, the manual lists instructions for handling sea planes and sets servicing area signs and equipment.

British Gas Tax Hits Clubs

A sharp increase in the tax on aviation gas is hurting Britain's flying clubs, which comprise the bulk of private flying there. In 1939, there were 400 airplanes owned by clubs but in December, 1949, there were only 275. Now, with 70 clubs still operating, there are only 200 airplanes. Members of flying clubs put in 45,000 hours of flying in 1947 compared with only 40,000 last year.

The additional government tax of \$1.40 on every flying hour has resulted in the clubs having to charge \$10.00 per instructional hour or \$9.50 solo. Whatever income has accrued to the treasury will be reduced under these suffocating taxes—and it may mean a death tag for British civil aviation.

• The new low price of \$595 for the complete Lear Omnimatic system places the Lear set among the lowest priced lightplane omnirange radio equipment available. The price includes omnirange and transmitting antenna. The Omnimatic flight indicator reading is instantaneous and automatic. When the set is tuned in to the omnirange, the flight indicator lights up with a "pip" pointing to the track to the station. The Lear two-way VHF receiver and transmitter have been reduced in price to \$354.

—BARBARA WARD

AMERICAN AVIATION

CAA Airworthiness Directives

Ercoupe Models 415C, CD and D which were required to have installation of a new trim tab stop and spring by May 1, 1950, according to A.D. Note 50-7-1, are not required to effect the change until September 1, 1950, according to Airworthiness Directive 50-27.

Beech AT-11 and C-18S twin engine aircraft must undergo inspection of the wing center section truss joints in the nacelle region for fatigue cracks. Inspection may be visual with magnifying glass but magnetic particle inspection with portable equipment is recommended. Cracks are repairable within limits specified in Part B, Beech Service Bulletin C18-11, February 1950, if oleo drag legs Beech Part 734-18005 or the equivalent are installed. Compliance required at next 100-hour inspection and at each 100 hours of operation by CAA Airworthiness Directive 50-20-2, dated 15 May 1950.

Piper-Stinson aircraft, 108 Series, must have a fuel "drip strip" attached to the underside of each wing, not later than September 1, 1950. Leaking tanks or spillage of gasoline during refueling has resulted in fuel running to the under surface of the wing, inboard to the fuselage and across the rear window where the fuel may enter the cabin wall and become a fire hazard. Compliance required by CAA Airworthiness Directive 50-25-1 and by Piper Service Bulletin 115.

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WINGS OF YESTERDAY

25 Years Ago

The Ford Motor Co. purchased all the stock and assets of the Stout Metal Airplane Co., Dearborn, Mich., on July 31, 1925, and was to begin production of the metal planes on a larger scale, with William B. Stout, designer of the aircraft, in charge of plane manufacture.

"The Pilgrim," the world's smallest airship and the first commercial lighter-than-air craft to be inflated with helium, was christened and sent on its inaugural flight in Akron, Ohio July 18, 1925, by its builders, The Goodyear Tire and Rubber Co.

10 Years Ago

(In AMERICAN AVIATION)

American Export Airlines was granted certificates by the Civil Aeronautics Board to operate trans-Atlantic passenger service between New York and Lisbon via Bermuda and the Azores.

The automotive industry was looming as a large factor in aircraft and engine manufacturing, with the number of companies engaged in aviation activity growing rapidly.

Pan American applied to the CAB for a route between New York and Bolama, Portuguese Guinea, by way of San Juan, Belem and Natal.

LETTERS

Air-Rail Advertising

To the Editor:

I have read with interest the issue of AMERICAN AVIATION Magazine containing the views of four railroad and airline officers on the subject of competitive advertising. Both points of view were ably presented. The discussion, as such discussions are likely to do, left the subject not very far from the place where it started but it should help both railroad and airline passenger people in developing better and more effective advertising.

ROBERT S. HENRY

Vice President
Association of American Railroads
Washington, D. C.

To the Editor:

If you see *Railway Progress* regularly you must realize that I have a weakness for the type of thing you have done on the "Air-Rail Feud." It fits my concept of good, informative and interesting journalism. In contrast to Col. Henry's demurrer quoted in your introductory note, I feel that there is a wealth of controversial matter which is as well or better dealt with publicly than not dealt with at all. And if neither the railroad industry nor the airlines benefit from such an exchange, it is because they cannot read or cannot learn from an intelligent discussion of a matter which has real bearing upon the growth of an important segment of their industries.

I particularly liked Mr. Tredway's restatement of the dictum that one should sell

one's product on its merits. It would be nice if both the airlines and the railroads built up their merits to the point where they were so busy selling them (and transportation) that they had neither the time nor the need to advertise their competitors.

It would be nice, but in the meantime Mr. Austin's advertising, the least subtle and, to railroaders, probably the most offensive competitive-comparative advertising running, is producing sales. With such a dollars-and-cents argument in a highly competitive field, who will blame Mr. Austin if the idea of an armistice does not appeal to him?

I was disappointed but hardly surprised to read in your introductory note that you had to go to six railroad executives to get two brief articles. I'm afraid my batting average in getting comment from railroad officials to run with controversial articles in *Railway Progress* is even lower. I wish they weren't so loathe to express themselves in print, especially where their interests or those of their industry are directly involved.

CLIFFORD H. RAMSDALL

Federation for Railway Progress
Washington, D. C.

Rudder Kicking

To the Editor:

The new series of flight assessments written by R. G. Worcester should be well accepted by the industry since it represents a source of general information for reference use on modern aircraft. One thing we would like to point out however, is the apparent misconception that the author has relative to the accepted aerial and ground gunnery practice. I have reference to comment made by the author on pages 22 and 23 of your May 1 issue, where he states:

"The military have, I think, greatly underestimated the value of the rudder in their fighter specifications. Suppose, for instance, you dive down to come up under the target and find while pulling out the heading is slightly off. You correct by using a mixture of aileron and elevator.

"With a powerful rudder able to hit a transverse acceleration of 3 G's (like Conval's delta wing) you could then kick the head straight into the target. A renaissance in power-operated rudders would be helpful."

It is the aggregate opinion of our pilot staff that such rudder kicking procedures are not S.O.P., since any control techniques other than those assuring perfect coordination scatter bursts worse than a sawed-off shotgun. The remainder of the article appears to be accurate. We will look forward to future articles.

OWEN Q. NIEHAUS

Chief Test Pilot
Bell Aircraft Corp.
Buffalo, N. Y.

(Editor's Note: Design-Engineering Editor Dick Worcester feels that although the point made by Mr. Niehaus is undoubtedly true, the trouble is that in the heat of combat, coordinated control movements may not bring the target properly into view and in the split second remaining the unfortunate pilot must simply do the best he can. The Korean War is showing how ground attack or air skirmishes with jets last but a few vivid moments before the fighter must turn back for home. So the use of a more powerful rudder is not prompted by the difference between using coordinated or uncoordinated control movements; it is dictated by the painful choice of either hurling some lead in the general direction of the enemy or carrying it back to base unused.)

Artificial Restrictions

To the Editor:

Refer to your article under Traffic and Sales "30 Airlines Fight for Caribbean Business," page 41, July 1.

You bemoan the fact of "artificial restrictions" under the "Sterling Block" policy, and that "Pan American flies between Jamaica and Trinidad but can't haul any payload from one to the other; in fact, it can't even fly a passenger from Port of Spain to London."

As a matter of curiosity, could you tell me how many foreign flag carriers carry traffic from say Miami to Puerto Rico or the Virgin Islands, or from the continental U. S. to Hawaii, or say from Seattle or the west coast to Alaska?

In the interests of fair reporting, it isn't exactly sporting to suggest the "Sterling Block" placing an artificial restriction on air travel, without pointing out that the U. S. follows an identical policy and, as far as I know, does not intend to change the policy in the foreseeable future.

D. A. SUMMERS

Hicksville, L. I., N. Y.

(Editor's Note: It's true that the United States, like Britain, applies the principle of cabotage to travel between the mainland and its possessions, or between any of those possessions. So far as we know, no foreign flag airline is permitted to carry passengers between the mainland and Puerto Rico and/or the Virgin Islands and we believe the same holds true for travel from the United States to Hawaii and Alaska. Most other nations with flag airlines of their own also observe this policy.

However, we do not believe it a fair comparison to intimate that the United States reaps the same benefits as the British from the cabotage principle. In the first place the United States does not have the many far-flung possessions of the British Empire on which to apply these artificial restrictions on naturally developing air traffic.

At the same time, the United States develops a vast volume of traffic to the Caribbean on which the British can capitalize through its cabotage policy. Thousands of tourists are drawn annually to the British island of Jamaica, for example, through widespread promotional activities of U. S. airlines. If these tourists decide to travel on to Trinidad or some other British possession, however, they must go by British lines. The U. S. has no comparable opportunity to work the deal in reverse.)

BOOKS

GERMAN-ENGLISH TECHNICAL DICTIONARY, by Kurt F. Leidecker. Published by S. F. Vanni, 30 West 12th St., New York, N. Y. Total price, both volumes: \$35.

Based on data compiled by the USAF, this is the first of two volumes and covers the alphabet from A to K, in 500 pages. Another volume should be on sale in October of this year covering the remainder of the alphabet.

OBITUARY

Wayne Parks

Wayne Parks, manager of the Beaumont, Texas, Municipal Airport, died on July 16. One of the best known airport managers in the U. S. for over twenty years, he was prominent in the activities of the American Association of Airport Executives.

Joseph P. Grace, Sr.

Joseph P. Grace, Sr., 78, retired president and chairman of the board of W. R. Grace & Co., died at his Long Island home July 15 after a long illness. He was instrumental in joining with PAA in 1929 to establish an international air service down the west coast of South America—Pan American-Grace Airways.

New ATR's Proposed

Since the end of World War II there has been a recognizable increase in factors affecting the skill requirements of commercial pilots. On the whole commercial aircraft are larger and more complex, traffic is heavier and the role of transport aircraft outside of the scheduled airlines has grown to sizable proportions. During this time experience requirements for commercial pilots have remained unchanged.

Major changes in the experience requirements for Airline Transport Ratings are now in the offing. These are outlined in a new CAB draft release, 50-5, which is now being circulated for comment. Probably the most drastic change ever proposed, the new regulation would establish additional ratings and reassign privileges accordingly.

As presently planned, the regulations would establish a new rating of Senior Airline Transport Pilot in addition to the existing Airline Transport Rating. A third rating Master Airline Transport Pilot, is also under consideration.

Basic Rating

Under the proposed changes it would be easier to get a basic ATR. Experience requirements would be lowered from 1,200 hours to 750 hours while the amount of time required as pilot in command of an aircraft would remain at 250 hours. Simultaneously privileges of the pilot with this rating would be reduced so that it would limit his command piloting in passenger carrying aircraft to those of less than 12,500 pounds gross weight. In cargo operations he could act as pilot in command up to 30,000 pounds gross weight, as second pilot he could serve as pilot crew member in planes up to 80,000 pounds gross weight.

Current CAR require that the pilot in command of the aircraft hold a Air Transport Pilot rating. This new regulation would require that all pilots and copilots in scheduled air transportation have ATR's. In irregular air carrier and other commercial operations of aircraft certificated for over 12,500 pounds gross the requirement would also be increased to require that all pilots hold air transport pilot ratings. This contrasts with the present regulation which requires the pilot in command and two pilots of three-pilot crews to have the ATR.

Senior Rating

To obtain the Senior Air Transport Pilot Rating, a minimum experience level of 2,000 hours would be required. Of this 300 hours shall have been as pilot in command and 500 hours shall have been in multi-engine equipment of not less than 1,800 maximum continuous horsepower. This is a substantial increase in former requirements.

As can be deduced from the limitations on regular Air Transport Pilots, this Senior rating would be required to fly as pilot in command of passenger carrying aircraft of over 12,500 pound gross weight, for cargo aircraft with maximum gross weight over 30,000 pounds and in any active pilot position on all aircraft of over 80,000 pounds gross weight.

The latter category, above 80,000 pounds, includes the Lockheed Constellation, Douglas DC-6 and Strata-cruisers. It is slightly above the weight of the Douglas DC-4 series. This 80,000-pound weight line is the basic

element on which the requirement for flight engineers is based.

Master Rating

CAB notes that there has been some interest displayed in the establishment of the Master Airline Transport Rating. While CAB itself does not recognize the need at this time, it is none-the-less seeking comments on this phase also. The MATR would require a minimum of 3,000 hours flight time of which 500 hours would have to be as pilot in command. At least 1,000 hours of the total should be as pilot in multi-engine airplanes of not less than 3,500 maximum continuous horsepower.

Under this proposal, the MATR would enable its holder to act as pilot in command of any type aircraft and limit the privileges of the Senior ATR to command of airplanes having less than 80,000 pounds gross weight.

If the new rules are adopted, January 1, 1951, would be set as the effective date and all pilot certificates with airline transport ratings issued prior to that time would expire then. They could be exchanged directly without the need for additional tests for an appropriate rating under the new requirements. Additional aircraft ratings in other types of airplanes or helicopters for non-commercial use would not be affected.

Roses to CAA

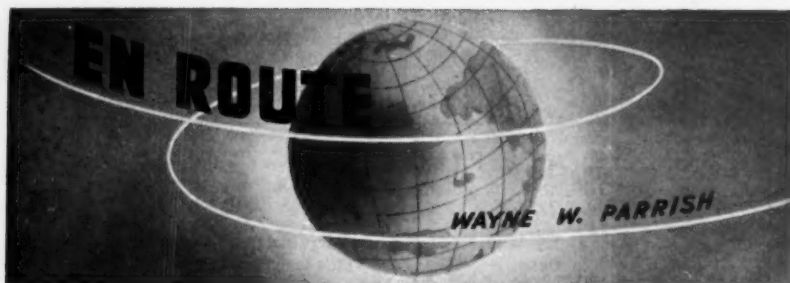
Charles Soderstrom, who recently flew his Bonanza non-stop from San Pedro to New York in 16 hours and 12 minutes to set a new class 3 lightplane record, has some appreciative words to say to the CAA people who helped him along the way: "Ever since I started flying around the United States, I have become a great admirer of the fine work of the CAA in advising the private flyer of weather conditions, winds aloft, and other necessary information. I would like to take this opportunity of thanking the CAA people for the wonderful cooperation they gave me during my flight. The boys at Long Beach Municipal Airport did a great job of keeping the newspapers and city officials of San Pedro advised as to my position at all times, and I want them to know that I am deeply grateful for these services."

How to Land the Comet

The following description of a landing made by de Havilland chief test pilot John Cunningham written by Captain S. R. Found of TCA. Found says, "The power was reduced to idle speed and at 220 knots the air brakes were extended, then the flaps and wheels. Power was increased to cruise and the aircraft slowed down to 160. The approach was made at 140 to 145 and the end of the runway was crossed at around 100 indicated . . . the throttles were cut (at a point) almost identical to that at which we cut them for a DC-4 landing. The touch-down was conventional and the aircraft, being so clean and with no braking action from the props, had a tendency to use a fair amount of runway, which was controlled with the brakes."

Stalling speed clean at 17,000 feet and 85,000 lb. was 102 knots indicated, which was reduced to 82 knots indicated with wheels, flaps and air brakes down.

In the de Havilland Gazette it was stated that the radio equipment is bolted direct to the structure without damping equipment. The instruments would also have been but for the fact that they are supplied complete with damping fixtures.



Pachamanca. Ever been to a pachamanca? No? Well, maybe you've never lived a clean life, but expel your sins and evil spirits and stop fretting. A pachamanca is just a Peruvian variation of an old-fashioned barbecue and I'll save you all the wear and tear of going to one by telling you about it. No use you gettin' bit by flies, fleas and ants, too.

For some not-yet-explained reason, Folger Athearn, Braniff Airways' manager for Peru, who normally is a very sane, sensible, able and personable guy, had the notion that the Braniff inaugural party of bankers, public officials and others, plus their wives, ought to attend a typical Peruvian affair. You know, local color and quaint customs just like you read about in the travel books.

It was a beautiful Sunday in Lima. The mountains and the seacoast looked inviting. Even the bar in the Bolivar Hotel wouldn't have been a bad investment. But no, we had to pile in cars and travel some miles east of town to a hacienda. A hacienda sounds like a big adventure until you find out that it really just means a farm. Brother Athearn had signed up the farm for the day.

It was a cozy, intimate affair. Only half the population of Peru was there. It seems that when you invite a Peruvian to go to a festive occasion, it's taken for granted that he'll bring all of his relatives and a few friends for good measure. Seriously, it's the custom down there. Invite one and you have the whole family. Brother Athearn had invited *mucho* Peruvians who brought *mucho* more Peruvians and somehow the entire American population of Lima came along too. Whenever the drinks are free, watch out.



Mucho Everything. The mimeographed sheet of directions which Brother Athearn had thoughtfully provided for his guests explained the thing this way: "A pachamanca is a traditional feast in which the main courses are prepared in a pit which has been prepared some time in advance lined with hot

stones and the food buried for several hours." And while you wait for the grand pit opening, there is *mucho* to drink, *mucho* music, *mucho* gayety, horsemanship demonstrations, cockfighting, in short, the whole works. Okey, you have the ball, now run with it.

At the risk of provoking an international incident, I'd like to provide my own definition of a pachamanca: "A pachamanca is held on a farm (hacienda) at the end of a dusty road (and any dusty road will do just so it's *mucho* dusty) in the presence of five times the number of people expected to attend, with an ample supply of flies and insects that bite your ankles, with dogs and kids competing for your standing room in the mob, with luke-warm drinks only slightly reminiscent of those served in bars downtown, with strange foods arriving infrequently and invariably cold, with bedraggled, unbathed Indians peering sadly at you through the wire fence, and a couple of instruments squeaking out some anonymous music for dancing on unwaxed board planks nailed to a temporary platform."

Or, to put it in fewer words, "Bud, know where I can get a good steak?"

Of course you can have some fun at a pachamanca. It isn't quite as bad as I have pictured it. I just never was a big picnic or barbecue guy, that's all.



Cockfight. There were some beautiful horses and some excellent riding and demonstrating, but the climax of the affair was a cockfight. I once saw a bullfight in Madrid, sat through it to the end, but I have never cared to see another. I have now added cockfighting to bullfights as something to see once.

It all seems so silly to tie sharp steel knives or blades on a couple of brainless cocks and watch them cut each other to ribbons. It's rather bloody before it's all over and a couple of cocks are dead or dying, and so what? If there is any skill employed I failed to see it. From what I could gather the principal reason for cockfighting is another excuse for betting. There's a lot of fun in some kinds of betting, but not over a couple of stupid cocks slashing each other to pieces. If knives weren't tied on the feet at least there might be some sport to it.

Anyway, we had a pachamanca, brother. It was a struggle, but we made it.

Spectacle. It's always risky to say a certain air route is the most spectacular in the world. But Braniff Airways can lay a strong claim to the title. The Braniff route from Lima to Buenos Aires (and the same route over the mountains is also followed on the Rio run) is nothing short of fantastic. Instead of crossing the Andes where the mountain range is narrow, the Braniff route



crosses at a wide part, and diagonally, so that you're in and over the mountains for several hours.

Those Andes are real grown-up piles of rock and they don't even give a name to anything under 18,000 feet high. During the winter, (when it's summer up here) there's plenty of snow. The DC-6 flies comfortably over the peaks and the variety of views is never-ending. Lake Titicaca, highest navigable body of water in the world (12,000 feet altitude), and the city of La Paz, 13,000 feet, are on the route. The western slopes of the Andes are barren but the eastern slopes are lush with green as they descend into the humid jungle. It's a fairyland trip over those imposing Andes and there are few such trips in the world to match it, if any.

Panagra has flown the route to La Paz and beyond for many years in DC-3's, but the DC-3 with its altitude limitations has to hug the mountains and the passes. The DC-6 flies high enough to provide a panorama of the entire area. Panagra has been flying DC-6's over two routes farther south for several years, but the northerly Braniff route cuts over the range at about the widest part. If it's mountain flying you want, go to South America.

Take Your Wipers. For six months of each year there is a permanent layer of clouds over Lima, the rest of the year it is dry and clear. But despite the clouds it rains not more than once every 25 years. Lima gets its water from the mountains and during the cloudy winter you can drive about 20 or 30 miles east into the mountains and be in beautiful sunshine. The cloud layer day after day becomes very depressing.

At night the clouds descend but there is no fog. There's a slight drizzle in the air, not enough for a raincoat but noticeable on your windshield when driving. Hence all cars have to have windshield wipers even though it doesn't rain. Petty thievery is so common in Lima that if you leave your car for a minute or two, the windshield wipers will be stolen. So those who drive cars have to attach the wipers when they drive, then take them off when parked. It's quite a nuisance. Dinner clothes or not, the automobile owner has to attach and detach wipers constantly during the winter season.



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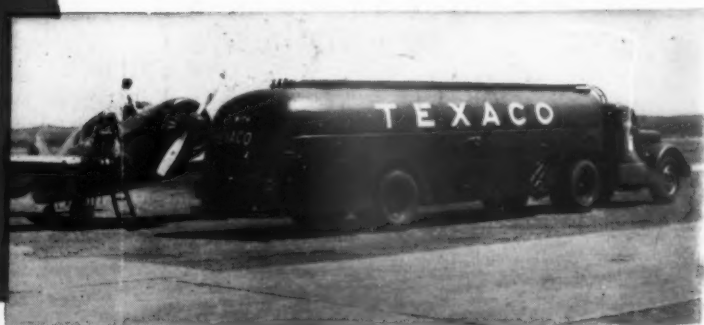
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